
Before You Begin

Welcome to Microsoft® NetShow On-Demand Server, a component of Microsoft NetShow version 1.0. NetShow On-Demand is designed to provide streaming, synchronized presentation data (including high-quality audio and video data streams) to accompany data stored on corporate intranets or on the World Wide Web. The *Microsoft NetShow On-Demand Installation and System Guide* contains instructions for setting up and using NetShow On-Demand in a corporate local area network (LAN) or as an intranet service.

A Microsoft NetShow On-Demand installation includes a NetShow On-Demand Server and one or more NetShow On-Demand Players connected by a network. Example networks include an Ethernet LAN, a corporate intranet, or a modem and phone line configuration such as the Internet. Microsoft NetShow On-Demand also includes the tools needed to manage the server configuration, as well as tools to format and update your edited multimedia content.

Windows NT® Server version 4.0 is the operating system platform that supports Microsoft NetShow On-Demand Server. The NetShow On-Demand client application, NetShow On-Demand Player, runs on Microsoft Windows® 95 or Windows NT Workstation versions 3.51 or later. NetShow On-Demand is available for the Intel x86, DEC Alpha, and IBM PowerPC platforms.

This chapter provides an introduction to NetShow On-Demand terminology, components, and features. Subsequent chapters describe requirements and procedures for installing and administering the system and for creating and managing content.

For the latest information about Microsoft NetShow On-Demand, browse our World Wide Web page at <http://www.microsoft.com/netshow/>.

About this Documentation

The *Microsoft NetShow On-Demand Installation and System Guide* includes:

- System overview
- Server setup
- Server installation and configuration
- Server administration
- Server content management
- Client installation and configuration
- Content creation

What You Should Know

It is assumed that you already understand the basic operation and administration of Windows NT Server, and that Windows NT Server is installed on your server computer. It is also assumed that you are familiar with the Internet and with Transport Control Protocol/Internet Protocol (TCP/IP). For intranet installations, you should be familiar with your particular network and with Ethernet issues in general.

Terminology

ActiveX

Microsoft ActiveX™ technologies refers to an open technology platform that extends the Windows architecture to include Internet and corporate intranet features and capabilities. It embraces both Java and Microsoft's Component Object Model (COM) technologies.

ActiveX streaming format (.asf)

A low-overhead storage and transmission format that encapsulates multimedia data types (images, audio, AVI, and so forth) as well as embedded text (for example, URLs), and allows for the synchronization of these objects within a stream. An .asf file can include audio, multimedia slide shows, and video content. NetShow On-Demand Server stores and streams .asf files.

ActiveX stream redirector (.asx) file

A one-line text file that transfers control of the data stream from the HTTP browser to the NetShow On-Demand Player application so that the data can stream. For more information, see Chapter 5, "Server Content Management."

ASF Editor project (.aep) file

An .aep file is an ASF Editor project file. It contains information about the images, audio, and objects that make up an .asf file. An .aep file (and the associated files stored in the .aep file directory) is required by the ASF Editor in order to modify an .asf file because .asf files cannot be edited directly.

ASF Editor

A graphical tool for authoring, testing, and generating an ActiveX streaming format (.asf) file. The tool is designed to handle most of the issues of encoding and timing of low- to mid-bit-rate content. It allows the author to place objects—sounds, images, and embedded text (for example, URLs)—so that they appear at the correct time during playback.

Hypertext Markup Language (HTML)

The language used to format information displayed on corporate intranets and the World Wide Web. HTML is a subset of Standard Generalized Markup Language (SGML), and like SGML, HTML uses tags to identify the format for a particular piece of information.

Hypertext Transfer Protocol (HTTP)

A protocol used to access information over intranets and the Internet. Other common protocols are FTP and Gopher.

Illustrated Audio

A combination of audio with images such as bitmaps, Web pages, slide images, or video frames that creates a synchronized multimedia presentation.

Microsoft Media Server protocol

A protocol used to reference and stream .asf files from a Microsoft NetShow On-Demand Server.

NetShow On-Demand Server

A Windows NT service designed for storage and real-time delivery of .asf files. NetShow On-Demand Server streams .asf files at varied bit rates, and is intended for use on an intranet or the Internet. In the corporate network environment, the server is targeted initially at 10-Mbps and 100-Mbps Ethernet networks.

NetShow On-Demand Player

An ActiveX-based client application that works with Internet browser software to allow playback of .asf files.

VidToAsf

A command-line utility that you can use to quickly convert an edited .avi or .mov file to an .asf file so that it can be stored on NetShow On-Demand Server and streamed to clients running NetShow On-Demand Player.

WavToAsf

A command-line utility that you can use to quickly convert an edited .wav audio file to an .asf file so that it can be stored on NetShow On-Demand Server and streamed to clients running NetShow On-Demand Player.

Release Notes for NetShow On-Demand

Release Notes for NetShow On-Demand Server

These release notes present updated information not available in the documentation.

Known Issues

Uninstalling Server and Administration Tools

The *Installation and System Guide* states that, to remove server *and* administration tools software from your server, use the **Remove On-Demand Server and Admin Tools** option on the **Start** menu.

Note, however, that uninstall will remove only the last option that you installed. For example, if you choose to install only the server and subsequently install the administration tools, uninstall will remove only the tools and Setup.exe. As a result, you cannot uninstall the NetShow server software, the first option that you installed.

In this case, you can uninstall the first option only by reinstalling it and then uninstalling.

Firewalls You must set some registry keys in order to stream HTTP through most firewalls. The values must be placed in the following registry key:

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\MMS\Client\Streamer\local

The values are :

Value	Meaning
ProxyEnabled (DWORD) 1	Use the proxy server
ProxyHost (String Value) "proxy server"	Name of the proxy server
ProxyPort (DWORD) 80	80 is the default HTTP/TCP/IP value. It can be different, depending on the site.

Note also:

Just having the proxy enabled doesn't mean you can stream through a firewall using UDP.

If you are using remote Winsock, either don't use any of the settings listed above, or set ProxyEnabled to 0.

Setting the ProxyEnabled to 1 may prevent your ability to play back .asf files via HTTP on a corporate network. Typically, a proxy server will redirect your HTTP request to an internal server if you try to access it with the proxy enabled. This should be transparent to the user, but may not be desired due to increased proxy server traffic.

Release Notes for NetShow On-Demand Player

These Release Notes present updated information not available in the documentation.

Known Issues

Minimum Display Requirements

The minimum supported display configuration is 640x480, 16 colors. In the 16-color display mode, the rendering quality will be limited. 256-color display mode or better is recommended. The drop-off in display quality is most noticeable when running Windows NT 3.51. For example, you will not be able to see the pie chart in the Statistics Property page and there will be no frame around the duration time for the player.

Clearing Settings in the Advanced Properties Page

If after setting up either a UDP Port or Proxy HTTP server, you decide that you want to clear the settings, you must clear the settings and then open a new instance of NetShow On-Demand Player. Clearing the UDP Port or Proxy HTTP server settings and the clicking Apply, will not remove the settings from the current instance of NetShow On-Demand Player. You must clear the settings, click Apply, and then open a new instance of NetShow On-Demand Player.

A Note About Using the VDOWave Codec

The VDOWave video codec subscribes to the H.263 video coding standard which is good for low-rate video coding, that is less than 112 Kilobits per second. Please be aware that the H.263 maximum image width is 352 pixels and height is 288 pixels. The height and width must be a multiple of 16. If you use this codec in creating .asf files, follow these guidelines for best results.

Problems with Using Short Audio Files in ASF Editor

You may experience problems working with audio files less than 7 seconds long in ASF Editor. For example, sometimes the audio cannot be moved close to the start of the file or up against the end of another audio file. To work around this problem you can: use a wave editing tool to combine the wave files or convert the audio to a different codec. Also, if error correction is turned off, this problem will not happen.

What Happened if NetShow On-Demand Player Buffered for a While and then Stopped Playing?

If NetShow On-Demand Player has to buffer an .asf file for >30 seconds, NetShow On-Demand Player will stop. An example of this: going to a marker that lies just in front of the rendering point of an image or stack of images that take more than 30 seconds to download. NetShow On-Demand Player would buffer for 30 seconds and then time-out.

C H A P T E R 1

System Overview

This chapter introduces the components of Microsoft NetShow On-Demand, and explains how these components work together to provide for the streaming of high-quality audio, illustrated audio (a combination of audio and synchronized images), and video over corporate intranets, LANS, or the World Wide Web. Subsequent chapters describe requirements and procedures for installing and administering the system and for creating and managing content.

This chapter introduces:

- The NetShow On-Demand environment.
- The NetShow On-Demand content tools.
- The NetShow On-Demand client player.
- The Server administration and content management tools included with NetShow On-Demand.

Introduction

Microsoft NetShow On-Demand consists of the following components:

- *Microsoft NetShow On-Demand Server*. This server runs as a Windows NT 4.0 service, and is capable of delivering multiple-bit-rate audio and video streams to Windows 95 and Windows NT clients. For more information on the Server, see Chapter 4, "Server Administration."
- *NetShow On-Demand Server Administration Utilities*. These include the Internet Information Server (IIS) Add-In, the Trace Facility, and the Log Facility.
- *NetShow On-Demand Player*. The Player can run as a stand-alone client executable, or can be embedded in Web pages or in MFC and Visual Basic applications via the client OCX (Nsoplay.ocx). For more information on NetShow On-Demand Player, see Chapter 6, "Client Installation and Configuration."
- *The ActiveX Streaming Format (ASF) Editor*. You can use this editor to assemble and synchronize video or audio files into a single .asf file, and to compress the .asf file for streaming in the low- to mid-bandwidth range. You can also use the ASF Editor to add command strings and URLs to a presentation. For more information on the ActiveX Streaming Format Editor, see the ActiveX Streaming Format Editor Help file (Winase.hlp).
- *Conversion tools*. These include VidToAsf and WavToAsf, command line utilities that you can use to convert .mov, .avi, or .wav files to the .asf format. For more information on these utilities, see Chapter 7, "Content Creation."

The NetShow On-Demand Environment

A Microsoft NetShow On-Demand installation includes one or more NetShow On-Demand Servers and one or more NetShow On-Demand Player clients connected by a network. Microsoft NetShow On-Demand also includes the tools needed to manage the server configuration, as well as tools to format and update your multimedia content.

The following describes a typical transaction between the NetShow On-Demand client and server.

A NetShow On-Demand client can be either the NetShow On-Demand Player, running as a stand-alone executable (Nsoplayr.exe), or the client ActiveX control (Nsoplay.ocx) embedded in an HTML page or in a Visual Basic or MFC application. This application can run on an intranet, the Internet, or a corporate LAN.

If the NetShow On-Demand player is embedded as an OCX in a Web page or an application, it has properties that can be set either at design time or run time. Among these is the **FileName** property, which typically consists of the URL to an .asf file. This URL uses the MMS protocol, and thus appears as follows:

```
MMS://servername/virtual_directory/filename.asf
```

In this URL syntax, *servername* designates the NetShow On-Demand Server, *virtual_directory* optionally specifies a directory that the Server administrator has configured to store .asf files, and *filename* designates an .asf file to play. The .asf file referenced in the URL is a file that has been created, or that has been converted from another format using one of the content creation or conversion tools included with NetShow On-Demand. For more information on the .asf file format, see “The ActiveX Streaming Format Editor,” later in this chapter.

When the OCX’s **Play** method is called, the server begins streaming the content to the client. The rate at which the server streams the file depends on the bit rate for which the .asf file was authored.

On the server side, the administrator can determine how much of the server’s resources are earmarked to service clients, the number of clients that can be connected at one time, and the per-file bit rate on .asf files. These settings, which are configured when you first install NetShow On-Demand, can be modified through the IIS Internet Service Manager, or programmatically through the admin OCX Nsoadmin.ocx.

Key Applications

NetShow On-Demand is designed to meet the streaming audio and video needs of small, medium, and large corporate applications, Web-based or not. Examples of applications that NetShow On-Demand supports include:

- Training materials
- Kiosks—retail and public service
- Audio/video libraries
- Annotated slide presentations
- Internal and external news programs
- Internal product and information Web pages
- Human resources–related programs
- Management information services–related programs
- Marketing and sales information

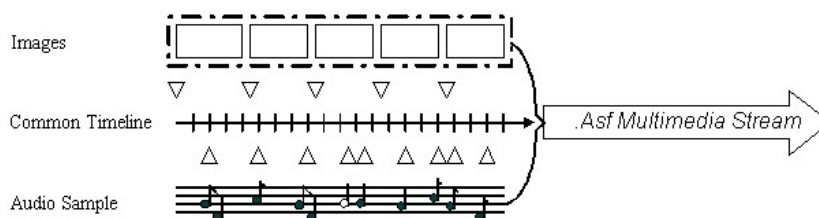
The File Format

NetShow On-Demand is specifically designed to stream ActiveX streaming format (.asf) files. ActiveX streaming format is designed for the efficient storing and streaming of synchronized multimedia content. The format does not replace existing formats, such as .avi and .wav, but rather repackages them for more generalized storage and transport. ActiveX streaming format allows multiple types of data—for example, audio objects, video objects, still images, command strings, and URLs—to be combined into a single synchronized multimedia stream that can be stored on a NetShow On-Demand Server and efficiently transmitted over a range of networks.

Because .asf is a streaming format, playback begins soon after the first data packets are received from the network. Typically, to play an audio or video file, the user must first download the entire file. With an .asf file, the synchronized audio and images are streamed to the client, so that the .asf file does not consume client cache or hard disk resources, and begins playing almost immediately.

How It Works

An .asf file is a multimedia stream composed of a number of media streams that are rendered in a synchronized manner. Each media stream consists of samples of the same type of data, such as images, sounds, command strings, and URLs. Each sample in a given stream has a time stamp, which defines when the sample should be rendered.



Components of an .asf file

As the preceding figure indicates, ActiveX streaming format allows media streams to be synchronized to a common timing mechanism, and then transported across a network without losing the synchronization and without altering the format of the underlying media. The format interleaves the samples from the different media streams in such a way that samples from the different media streams arrive at regular intervals with little difference between when they arrive and when they need to be rendered.

Error Correction and Masking

ActiveX streaming format addresses the potential for network data loss through error correction and masking techniques. These include the use of error-correcting codes and the distribution of sample segments over multiple transport or storage blocks, and the use of data dispersal to conceal the error.

For example, using the sample segmentation technique, a single sample would have its data spread across multiple packets so that if the network lost a packet, the loss would not cause the omission of large amounts of sequential information. If multiple sequential packets of information were lost, the ActiveX streaming format would allow the player application to detect the errors and would use the format's error-masking capability to conceal the error by replicating data from adjoining packets to fill in those areas where data was lost.

Bandwidth Considerations

The bit rate at which an .asf file plays depends on the bit rate for which it was authored. This is important to system administrators in particular because they will be very concerned with how bandwidth is consumed by any multimedia application running over a corporate network.

You can use the IIS Internet Service Manager to limit the aggregate bandwidth of a NetShow On-Demand Server and the number of users that can be connected. You first use the Configuration tool during server setup (see Chapter 2, "Setting Up Your Server"), but you can rerun the program to adjust the parameters as necessary. Guidelines for using the tool to change your configuration are provided in Chapter 4, "System Administration."

The NetShow On-Demand Content Tools

The NetShow On-Demand software package includes the tools necessary to compose .asf files from existing media. As a rule, you should use professional development tools to create and modify source content prior to converting it into .asf files. For example, if you need to lower the bandwidth, make color changes, or adjust your audio quality, you need to use your own professional editing tools to perform these tasks before you create the .asf file.

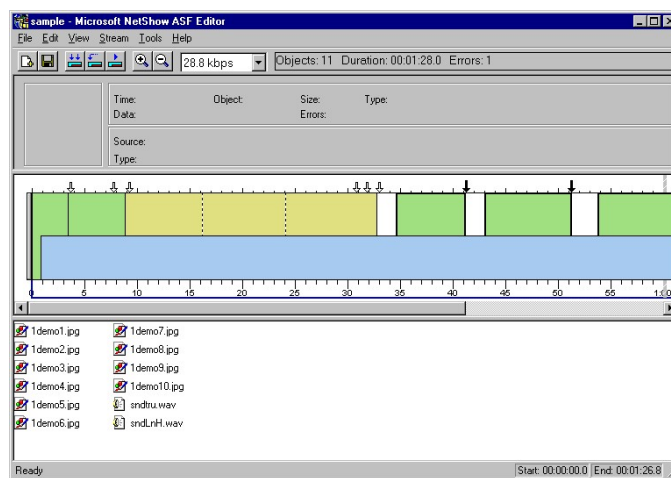
NetShow On-Demand includes the following tools for assembling .asf files from existing data:

- ASF Editor, a graphical user interface (GUI) tool that allows URLs, images, and audio clips to be synchronized on a common timeline at low to mid bit rates. (For more information, refer to the ASF Editor online Help file.)
- VidToAsf, a conversion utility that allows you to convert .avi and .mov files to .asf format.
- WavToAsf, a conversion utility that allows you to convert .wav files to .asf format.

The ActiveX Streaming Format Editor

The ActiveX Streaming Format (ASF) Editor combines images and audio to produce multimedia data in the .asf format. After using the ActiveX Streaming Format Editor to assemble .asf files, you can use NetShow On-Demand Server to stream these files to NetShow On-Demand Player.

For detailed information on how to use the ActiveX Streaming Format Editor, see the Help file (Winase.hlp) that accompanies the tool.



Converting Video and Sound Files to ASF

To convert video files such as .avi or .mov files to the .asf format, use the VidToAsf command line conversion utility. To convert .wav files to .asf, use the WavToAsf command line conversion utility. Both of these utilities are included in the Tools subdirectory on the NetShow On-Demand compact disc.

For information on how to use these tools, see Chapter 7, "Content Creation."

The NetShow On-Demand Client

The NetShow On-Demand client is called NetShow On-Demand Player. This player can be either a stand-alone executable (Nsoplay.exe), or an OCX (Nsoplay.ocx).

Use the stand-alone executable to open files on a local or network drive or URLs that reference .asf files.

The OCX is an ActiveX control that can be embedded in an HTML page, a Visual Basic form, or an MFC dialog resource. After you have embedded the OCX, you can set properties on it and call its methods. For more information on the NetShow On-Demand client OCX, see the NetShow On-Demand Client SDK.

NetShow On-Demand Server

NetShow On-Demand Server is a service that runs on Windows NT 4.0. It is capable of streaming audio, illustrated, and video at multiple bit rates to Windows 95 and Windows NT clients over LANs. Because NetShow On-Demand Server actually *streams* data to the client, it offers a host of advantages over other remote solutions, such as drive sharing. For example, NetShow On-Demand Server makes it possible for the server administrator to specify how much of the server's resources will be devoted to NetShow clients, and to specify the maximum allowed bit rate for each file that clients access.

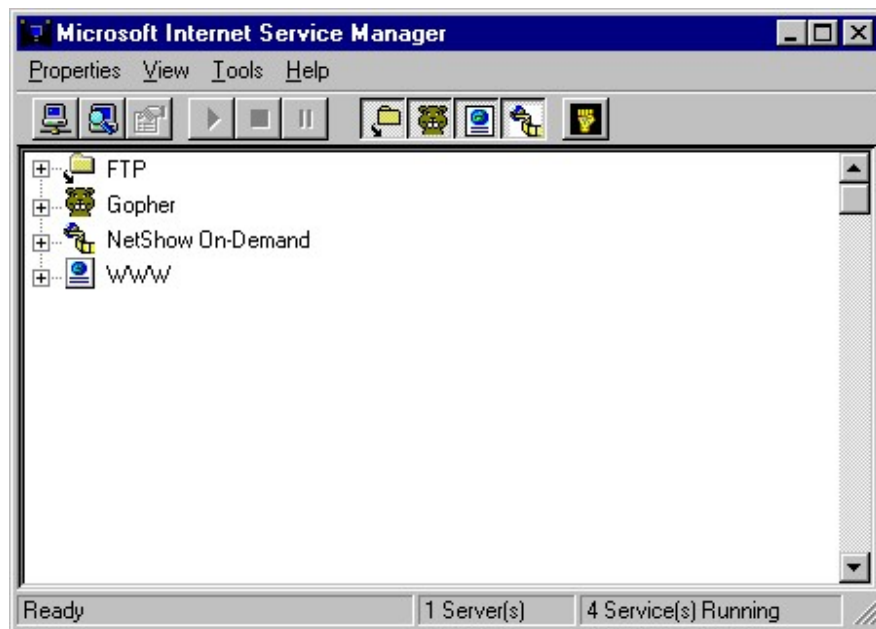
In addition, NetShow On-Demand makes use of the standard utilities and features that Windows NT provides:

- An Internet Information Server (IIS) Add-In, which makes it possible to configure and use NetShow On-Demand from within IIS as if it were a native IIS service. This integration also makes it possible for administrators to configure NetShow On-Demand to use virtual directories. For more information on this Add-In, see "NetShow On-Demand and Internet Information Server," later in this chapter.
- For Performance Monitor support, NetShow On-Demand Server provides a preconfigured NetShow On-Demand Server settings file called Nsoperf.pmc. This file defines a number of performance counters that allow an administrator to monitor system resources and performance. For more information on Performance Monitor counters, see Chapter 4, "Server Administration."
- An On-Demand Log Facility that logs server events to a Microsoft Access file.
- An On-Demand Trace Facility that displays server events in a console.

NetShow On-Demand and Internet Information Server

Microsoft Internet Information Server (IIS) is a Web server that makes it possible for you to publish information on a corporate intranet or on the Internet. IIS 2.0 is included with Windows NT Server 4.0.

The NetShow On-Demand Server includes an IIS Add-In that is installed when you run NetShow On-Demand Server Setup. This installation adds NetShow On-Demand to the services supported by IIS, so that NetShow On-Demand is listed among the services displayed in the IIS Internet Service Manager window.

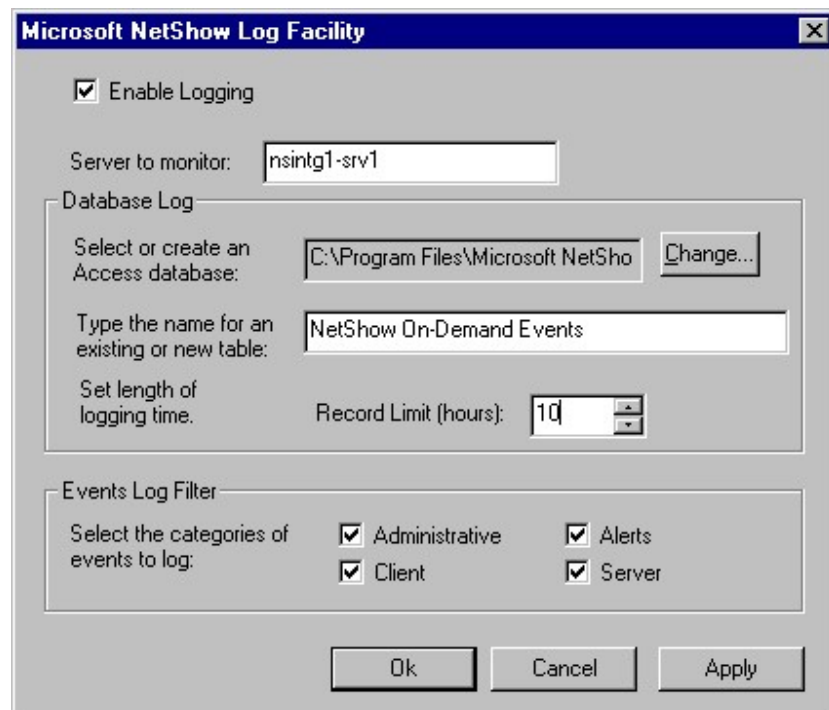


Like other IIS services, you can configure the NetShow On-Demand service to use *virtual directories*. A virtual directory derives its name from the fact that you can create any number of directories beneath an IIS service, and then can assign any number of these directories the same *alias*, so that they are referenced identically in a URL. The fact that two URLs that explicitly reference the same directory identify movies that reside in two different physical directories is transparent to the client, provided that the two physical directories have the same *alias*.

The On-Demand Log Facility

The On-Demand Log Facility is an application that makes it possible for you to configure server events that you want to log to a Data Access Object (DAO). When you install NetShow On-Demand Server, Setup creates a database, and a table within that database, to which logged events are redirected. By default, the database name is Nslog.mdb, which is stored in the \Program Files\NetShow\on-demand\server directory. The default table name is NetShow On-Demand Events.

When you start the Log Facility, a tray icon appears to let you know that a background process is running. To access the application, simply double-click the tray icon.

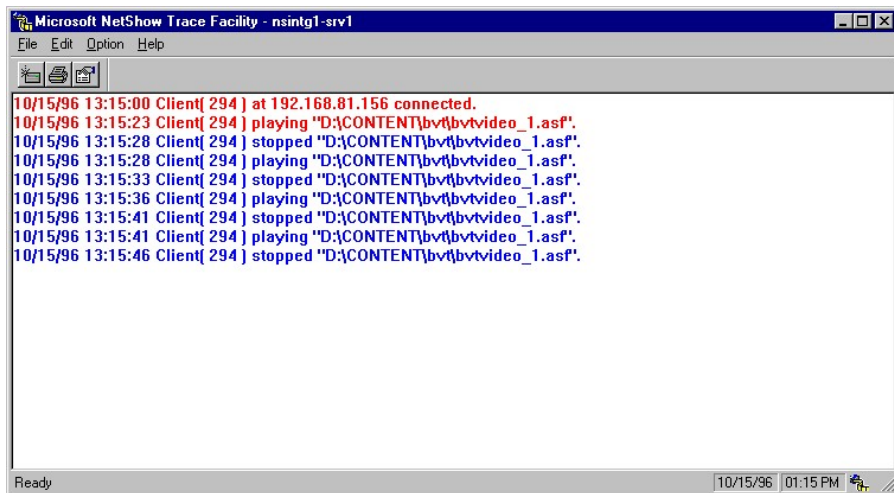


For more information on the Log Facility, the application's default options, and the events that you can log, see "Using the NetShow On-Demand Log Facility" in Chapter 4, "Server Administration."

The NetShow On-Demand Trace Facility

The NetShow On-Demand Trace Facility is a tool that network administrators can use for monitoring and troubleshooting the server. For example, the tool can be used to look for occurrences of irregular events or for troubleshooting server problems by observing the response to a particular action on the server.

Although the results of a trace can be saved to a file, the Trace Facility is distinguishable from the Log Facility in that the events monitored by the Trace Facility are logged directly to a window that is similar to a console. Events appear as text messages in the window.



For more information on how to use this utility, see “Using the NetShow On-Demand Trace Facility” in Chapter 4, “Server Administration.”

CHAPTER 2

Setting Up Your Server

This chapter describes hardware and software requirements for a Microsoft NetShow On-Demand Server and includes an overview of server preparation.

Hardware

The following table summarizes the minimum and recommended hardware for a NetShow On-Demand Server running Windows NT 4.0.

Component	Recommended	Minimum
Processor	Pentium/133 MHz	486/66 MHz
Bus	PCI	EISA
Memory	48 MB RAM	24 MB RAM
NIC (network interface card)	High-throughput Ethernet NIC* For 10 Mbps, Compaq NetFlex 2 ENET TR or Intel EtherExpress Pro 10/100B(PCI) For 100 Mbps, SMC EtherPower 10/100, DEC DE500, or Compaq NetFlex 3	Any Ethernet NIC
Content storage space	At least one dedicated disk drive for content storage—for better performance, use two or more identical disk drives configured as “stripe sets”	A dedicated NTFS disk partition

* The network interface cards shown here have been tested by Microsoft. You can use any Ethernet NIC with NetShow On-Demand—however, performance may be limited if network-card throughput is insufficient for the number of clients.

Software

Make sure the following software is installed on the NetShow On-Demand server computer:

- Microsoft Windows NT Server version 4.0
- Microsoft Internet Information Server version 2.0

Firewall Support

Microsoft NetShow On-Demand Server will support the released version of Microsoft Internet Proxy Server 2.0 (expected to ship Q4/1996). Installation information will be available at <http://www.microsoft.com/netshow/> at that time.

Preparing Content Drives

When configuring a NetShow On-Demand server computer, a certain amount of disk space is required for content storage. At a minimum, you should create an NTFS disk partition, though a dedicated disk drive is recommended.

If you intend to stream high-bandwidth content (or large amounts of lower-bandwidth content), you should consider using dedicated disk drives. For best performance, you can use Disk Administrator to configure dedicated content drives as “stripe sets.” Disk “striping” is a technique used in combination with RAID (redundant arrays of inexpensive disks) to improve server performance. At least two identical (same manufacturer, same model, same capacity) disk drives are required to form a striped disk set (up to a maximum of 32 identical disk drives).

In its most basic form (RAID level 0), Windows NT creates a stripe set disk file system by dividing data into blocks and spreading them in a fixed order across all disks in an array. By adding data to all partitions in the set at the same rate, this type of disk striping offers the fastest performance. Other RAID versions (for example, level 1 and level 5) use different topologies and are optimized for other applications.

After you create a stripe set, the entire disk set is labeled with a single drive letter. To learn more about disk striping, see Disk Administrator Help.

Performance Considerations

Creating a Balanced System

You can configure a NetShow On-Demand server to provide data streams at a constant rate to a large number of users. After you determine the maximum stream rate and maximum number of clients, the primary challenge will be to create a balance between your anticipated user load and your network card, disk speed, memory, and the power of your CPU. The level of balance you need to attain will depend on how high you want to set the aggregate bit rate for streaming.

The following sections outline how to calculate what a low-demand NetShow On-Demand configuration and a high-demand NetShow On-Demand configuration can support.

Determining Desired Aggregate Output

Total aggregate output is determined based on the following three factors:

- Maximum number of clients you want connected to your server at any given time and/or
- Total aggregate bit rate (measured as units in bits/second) the server will stream and/or
- Maximum bit rate (measured as units in bits/second) any one file can be streamed

Any one of the factors can create a bottleneck for your server. For instance, if you set the maximum number of clients to 10, the total aggregate bit rate to one megabit per second (Mbps), and the maximum stream of any one file to 20 kilobits per second (kbps), the bottleneck for your server is the maximum number of clients. Based on the total aggregate bit rate specified and the limit of each stream, the server could handle a maximum of 50 clients. But because you limited the maximum number of clients to 10, your server will not allow additional clients to access streams even though the server has not reached the maximum aggregate bit rate of one Mbps.

Knowing the total aggregate bit rate will help you determine whether you need a low-demand or high-demand configuration. A general rule is that when the total aggregate bit rate exceeds the capacity of one disk (low-demand configuration scenario), you will need to move to a high-demand configuration. This is the point at which planning and creating a balanced system become critical.

Low-Demand Configuration

What is meant by a low-demand configuration? If you intend to run NetShow On-Demand on your personal computer running Windows NT along with applications, and have limited network capacity, your planning should be for a low-demand configuration. An example of a low-demand configuration is if your corporation has only a 10-Mbps shared Ethernet network. In this case, you may want to limit the streaming capacity of the NetShow On-Demand server to one Mbps so as to not interfere with your company's routine network traffic. Because the maximum aggregate bit rate is equal to one Mbps (or 1,000 kbps), if you set the maximum stream of any file to 20 kbps, you could support a maximum of 50 clients at any one time:

$$20 \text{ kbps stream} \times 50 \text{ clients} = 1,000 \text{ kbps (or one Mbps)}$$

However, if the maximum stream were increased to 500 kbps, you could support only two clients at any one time. Because the stream for each file will likely vary, it is more important to set the maximum aggregate bit rate. After you set a maximum bit rate for NetShow On-Demand, the load placed on the server will vary depending on the number of NetShow On-Demand Players attempting to simultaneously access the server and the bit rates of their streams. An optimal strategy is to determine the aggregate bit rate you are willing or able to put on the network.

For example, if you set the maximum aggregate bit rate to one Mbps and you have two files at 500 kbps and 50 files at 20 kbps, you can support between two and 50 clients. In cases such as these, where a small number of NetShow On-Demand Players can monopolize the server, you may want to consider limiting the per-file bit rate. For example, given the above settings and number of potential NetShow On-Demand Players, if a low-bit-rate training presentation needs to be streamed for 35 clients, you may want to lower the per-stream bit rate to allow as many NetShow On-Demand Players as possible to access the presentation.

Before setting up a low-demand configuration, you should run Performance Monitor and evaluate your existing system. This will help you determine whether your desktop computer can support NetShow On-Demand client requests and your anticipated total aggregate bit rate. By establishing a benchmark for your existing server and evaluating other constraints such as hardware, Internet Information Service, and WWW Service, you can best determine whether your current server will meet your need, whether you need to set up a low-demand configuration using a separate, dedicated server, or whether you need to plan for a high-demand configuration.

Monitoring the Performance of Your Configuration

By monitoring performance of your low-demand configuration, you can best determine whether it's meeting your needs or whether you need to move to a high-demand configuration. Performance Monitor—accessed via the Administrative Tools group in the Windows NT Server products—is a graphical tool for measuring the performance of your Windows NT server. For more information about Performance Monitor, see Chapter 4, “Server Administration.” In addition to the standard object type Windows NT offers, there is also a NetShow On-Demand Services object type that offers a unique set of counters including active streams, aggregate read rate, aggregate send rate, allocated bandwidth, connection clients, connection rate, late reads, scheduling rate, stream errors, and stream terminators. You can use these counters to evaluate the performance of your NetShow On-Demand server.

Using Performance Monitor, you can determine whether you are approaching your maximum aggregate bit rate or maximum number of clients. If you consistently come close to your maximum settings or if you notice performance degradation in other applications running on your network, use Performance Monitor to first tune the system to make the most efficient use of existing resources. If you continue to experience performance problems, you may want to consider moving to a more powerful configuration—one dedicated solely to running NetShow On-Demand.

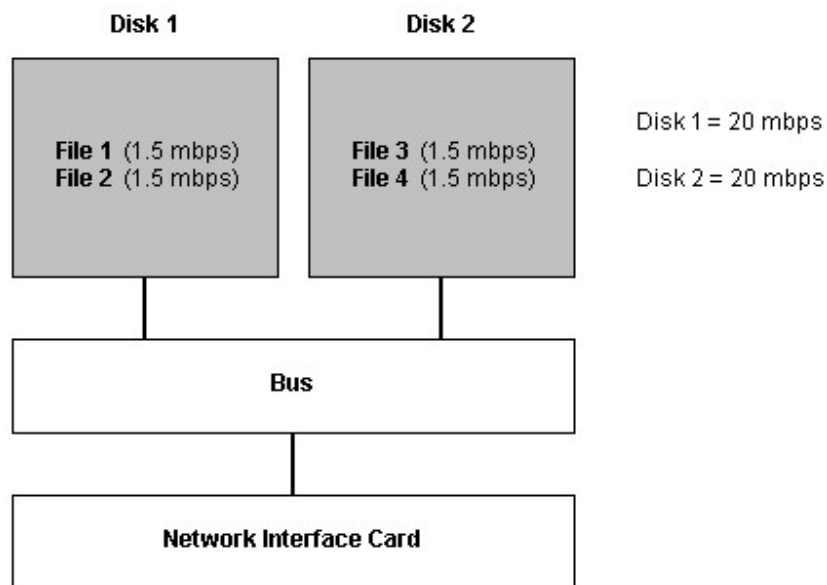
High-Demand Configuration

In general, if you use a 100 Mbps (shared or switched) Ethernet network, you will likely require a high-demand configuration. With this type of server you can handle high stream bit rates and a large amount of content. To ensure clients are able to access these streams, you need to carefully plan and configure a system that is both balanced and optimized for performance.

A high-demand configuration with a 100-Mbps shared network could easily support a total aggregate bit rate of 30 Mbps. This means that 20 clients could simultaneously access a stream bit rate of 1.5 Mbps:

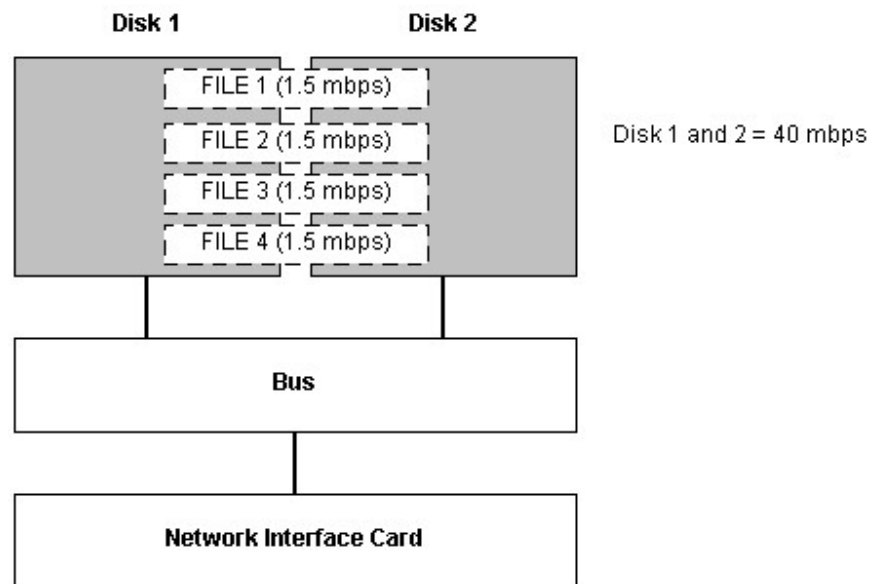
$$20 \text{ clients} \times 1.5 \text{ Mbps stream} = 30 \text{ Mbps (total aggregate bit rate)}$$

Based on the above information, if you had a maximum disk throughput of only 20 Mbps, your total aggregate bit rate would exceed the capacity of one disk. To solve this problem, you could add a second disk having 20-Mbps throughput. Adding a second disk would mean that 13 of the 1.5-Mbps streams would exist on one disk and seven on the other. Using the example below, if all 20 clients attempt to access the same stream—say File 1—simultaneously, a second disk alone will not solve the problem.



To truly solve this problem you need to create a disk stripe. A disk stripe is a collection of disks linked together whose aggregate performance is greater than that of any one individual disk. Of all disk management strategies available for Microsoft Windows NT Server, disk striping offers the best performance. This method increases both read and write performance because multiple I/O commands can be active on the drives at the same time.

Using the same scenario, if you had two 20-Mbps disks in a disk stripe, you would essentially have a total aggregate bit rate of 40 Mbps. Each stream would use space on both disks, as seen in the illustration below, rather than existing solely on one, thereby allowing all 20 clients to access the same 1.5-Mbps stream.



Other Factors Affecting Performance

Although you set the maximum bit rate of the NetShow On-Demand Server, it is possible for servers running on a corporate network to be affected by “bursty” applications (those that require large amounts of bandwidth when they execute, such as file transfer programs). If this happens, the streams may degrade to unacceptable levels or not run. Therefore, it is important to be aware of the requirements of other applications running on your network and to allocate bandwidth with those considerations in mind.

Windows NT Cache Manager and NetShow On-Demand Interactions

The I/O architecture includes a single Cache Manager that handles caching for the entire I/O system. Caching is a method used by a file system to improve performance. For example, instead of reading and writing directly to the disk, frequently used files are temporarily stored in a cache in memory, and reads and writes to those files are performed in memory. On a NetShow On-Demand server, however, the Cache Manager decreases performance, particularly with systems streaming high bit rates. Because most data streams aren't reused, it is recommended that you turn off Cache Manager.

- **To turn off Cache Manager**
 1. Right-click Network Neighborhood.
 2. Select **Properties**.
 3. Select the **Services** tab.
 4. Select **Server**, then click **Properties**.
 5. Select **Maximize Throughput for File Sharing**.

CHAPTER 3

Server Installation and Configuration

This chapter describes software installation of Microsoft NetShow On-Demand Server.

Note

The Microsoft NetShow On-Demand protocol is now supported by many firewall vendors. Please visit our site at <http://www.microsoft.com/netshow/> for the latest information on firewall support

Microsoft NetShow On-Demand Installation

System Requirements

Before you install Microsoft NetShow On-Demand Server, make sure that:

- The server computer is running Windows NT Server version 4.0 (the NetShow On-Demand Server will not work on Windows NT Workstation).
- You have an NTFS partition and that all compression is turned off for that partition (highly recommended).
- You have at least 20 MB of free disk space.

Note

Microsoft has tested NetShow On-Demand at the following capacities:

- *With 10-Mbps network interface cards.* 300 streams at 28.8 Kbps, 80 streams at 100 Kbps, and 20 streams at 300 Kbps.
- *With 100-Mbps network interface cards.* 140 streams at 300 Kbps and 21 streams at 2 Mbps.

Installing the Server Software

Use the NetShow On-Demand Server Setup program to install and configure NetShow On-Demand Server. The Setup program is available from the Microsoft NetShow On-Demand Web site (<http://www.microsoft.com/netshow/>).

- **Verify that Microsoft IIS is installed**
 - On the Windows NT **Start** menu, point to **Programs**, then point to **Microsoft Internet Server (Common)**. Look for Microsoft Internet Service Manager—this must be installed before you can install Microsoft NetShow On-Demand Server.

By default, IIS (Internet Information Server) is installed during Windows NT Server version 4.0 installation. If for some reason IIS isn't installed, insert the Windows NT Server compact disc in the CD-ROM drive. On the Windows NT **Start** menu, point to **Programs**, point to **Settings**, and then click **Control Panel**. Double-click the network icon. On the **Services** tab, highlight Internet Information Server 2.0, then click **Add**.

- **To download NetShow On-Demand Server and administration tools**
 - Nsosrv.exe is a self-extracting file that installs Microsoft NetShow On-Demand Server.

One way to get this file is to connect to <http://www.microsoft.com/netshow/> and download it. Click **Save it to disk** and copy Nsosrv.exe to your temporary directory.

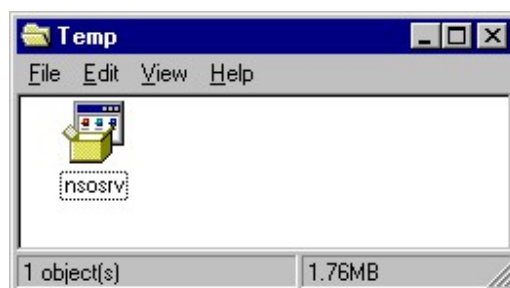


- **To install NetShow On-Demand Server and administration tools**

1. Go to your temporary directory, and then double-click **nsosrv.exe**.

Note

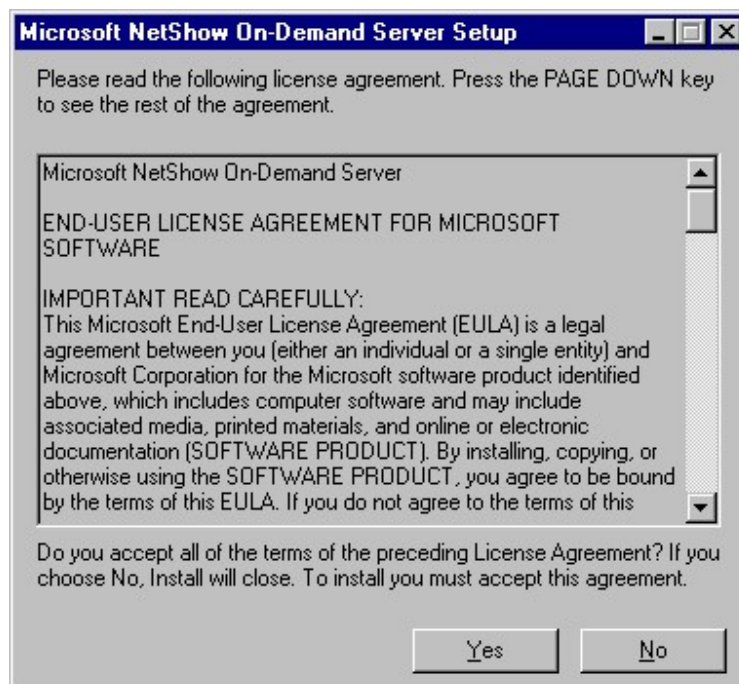
Saving Nsosrv.exe to your temporary directory before starting the installation process is not required—however, this makes it easy to reinstall NetShow On-Demand Server (after uninstalling first, simply go to the temporary directory and run Nsosrv.exe again).



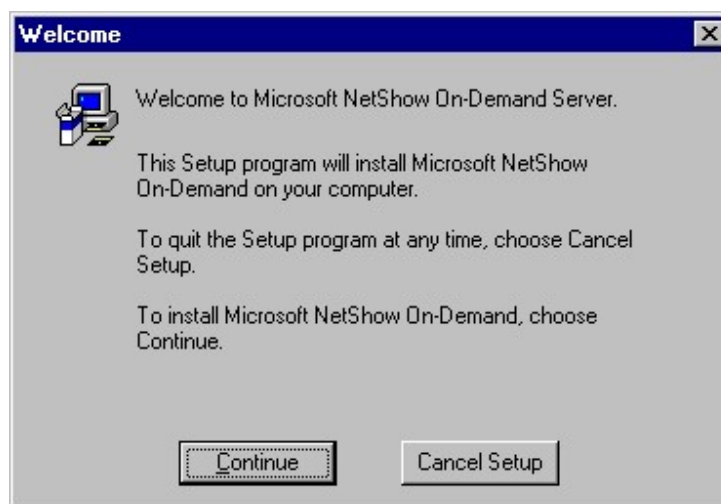
2. When prompted to continue, click **Yes**.



3. Setup first prompts you to accept the terms of your agreement with Microsoft. If you accept these terms, click **Yes** to continue.

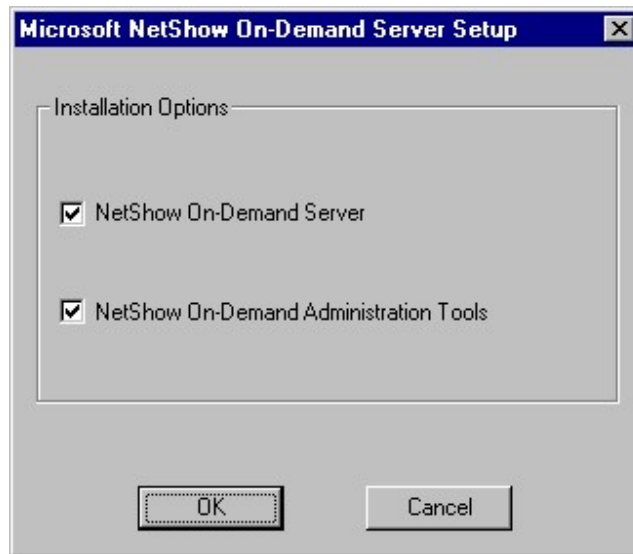


4. In the **Welcome** dialog box, click **Continue**.



5. In the **Server Setup** dialog box, select **NetShow On-Demand Server** and **NetShow On-Demand Administration Tools**. Then click **OK**.

The server installation includes the NetShow On-Demand Server and the Internet Information Server Administration tools. The tools installation includes the NetShow On-Demand Trace Facility and the NetShow On-Demand Log Facility.

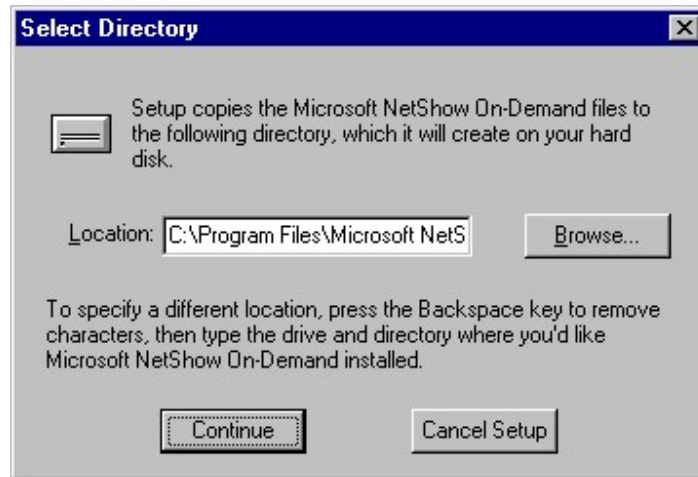


6. You use the **Select Directory** dialog box to specify the destination directory for NetShow On-Demand Server. To accept the default location of C:\Program Files\Microsoft NetShow, click **Continue**. Otherwise, specify an appropriate location.

Note

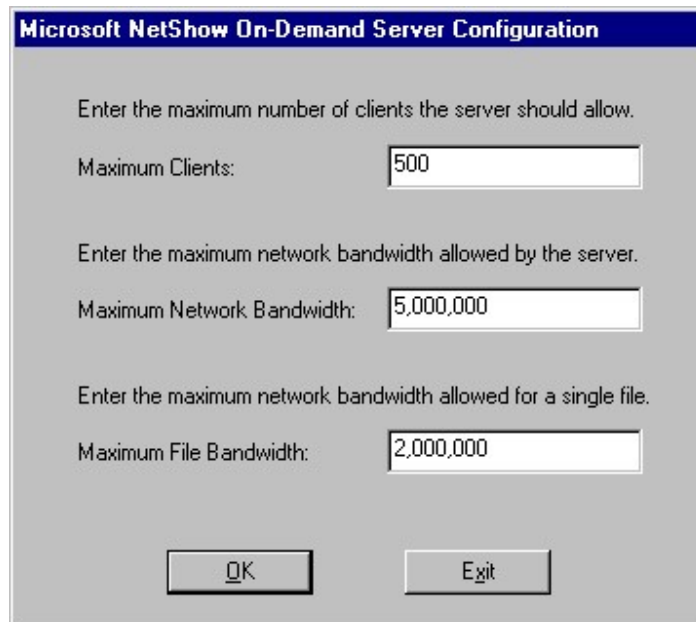
Do not install NetShow On-Demand Server on a shared network drive. NetShow On-Demand Server should be installed on the local hard disk drive.

NetShow Setup copies the server software and administration tools to this directory.



7. In the **Server Configuration** dialog box, select the maximum numbers for clients and bandwidth. You can type numbers or accept the Setup defaults:
 - In the **Maximum Clients** box, type the maximum number of clients that can connect to the server at any one time. The minimum setting is 0, the maximum 10,000.
 - In the **Maximum File Bandwidth** box, type the maximum size (in bits per second) of a file that can stream across the bandwidth. The minimum setting is 0, the maximum is 6,000,000.
 - In the **Maximum Aggregate Bandwidth** box, type the size of server bandwidth (in bits per second). The minimum setting is 0, the maximum 100,000,000, and a typical setting around 100,000 bps.

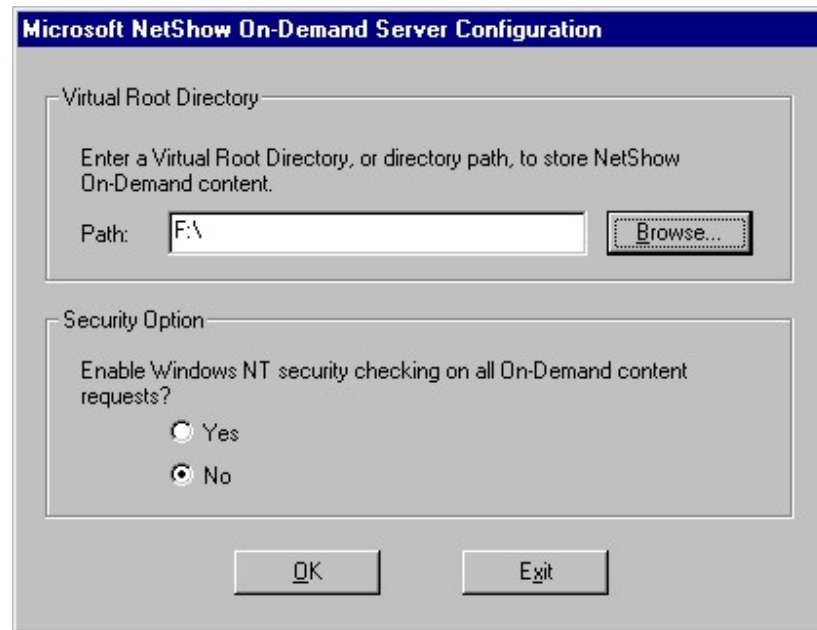
After you select the settings, click **OK**.



The screenshot shows a dialog box titled "Microsoft NetShow On-Demand Server Configuration". It contains three input fields for server settings. The first field is "Maximum Clients" with a value of 500. The second field is "Maximum Network Bandwidth" with a value of 5,000,000. The third field is "Maximum File Bandwidth" with a value of 2,000,000. At the bottom, there are two buttons: "OK" and "Exit".

Setting	Value
Maximum Clients	500
Maximum Network Bandwidth	5,000,000
Maximum File Bandwidth	2,000,000

8. In the **Server Configuration** dialog box, you must choose a virtual root directory for the content files. In the example here, we chose drive F because that's where our content is stored.



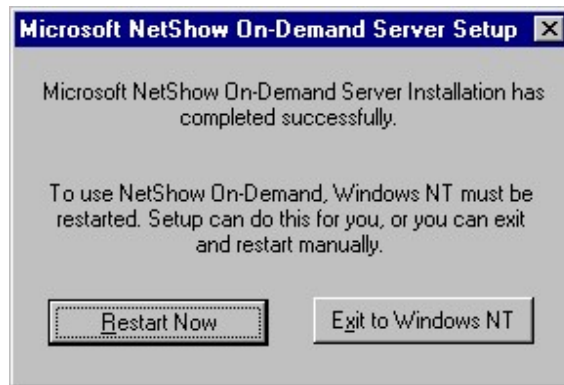
9. In the **Path** box for the virtual root directory, type the drive and directory where you will store the .asf files (the server content).
Do not use the same directory you used to install the server files (that is, Program Files\Microsoft NetShow). For the most efficient data streaming, store the content on the NTFS partition or on separate disk drives.

Note

In order for the server to stream .asf files, the drive's subdirectory where the content files are stored must have at least read privileges for the administrator of the server computer.

10. Select the setting for security support. Select **Yes** for security checking, or select **No** for no security checking.
If you select security support, NetShow On-Demand Server will use the Windows NT Access Control Logic to permit access to server content.

11. Click **OK**.



Note

Before using NetShow On-Demand Server, you must restart your computer. You can choose to restart now, or you can return to Windows NT Server and restart later.

- **To test NetShow On-Demand Server**

During the NetShow On-Demand Server installation, a sample .asf file is automatically copied to the virtual root directory. After you install NetShow On-Demand Player (as shown in Chapter 6, “Client Installation and Configuration”), you can play this sample .asf file on the client computer to verify that NetShow On-Demand Server, NetShow On-Demand Player, and your network connection are all working properly.

Setting HTTP Server MIME Type

During NetShow On-Demand Server installation, two MIME (Multipurpose Internet Mail Extensions) types for the .asf and .asx extensions are automatically added to the server computer’s registry. If your HTTP server is installed on the same computer as NetShow On-Demand Server (and you are using Microsoft IIS as your HTTP server), no further action is required.

If you are using a non-Microsoft HTTP server—or using Microsoft IIS as your HTTP server *on a different computer*—you must add the .asf and .asx extensions manually as shown in the following procedures.

- **To manually set MIME type for Microsoft Internet Information Server**

Note

The following procedure is required only when the Microsoft Internet Information Server (IIS) is located on a different computer.

1. Go to the server computer where your HTTP server is located. On the Windows NT **Start** menu, click **Run**.



2. In the **Open** box, type **RegEdt32**.
 3. Open the
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\
Parameters\MimeMap directory.
 4. On the **Edit** menu, click **Add Value**.
 5. In the **Add Value** dialog box, type (MIME type, extension, gopher type)
video/x-ms-asf, asf, , 5
and click **OK**. Do not enter a string.
 6. On the **Edit** menu, click **Add Value**.
 7. In the **Add Value** dialog box, type
video/x-ms-asf, asx, , 5
and click **OK**. Do not enter a string.
 8. Restart IIS or restart the computer.
- **To set MIME type for non-Microsoft HTTP servers**
For HTTP servers other than Microsoft IIS, you must add the following MIME settings (to do this, refer to your HTTP server documentation). Afterwards, you may need to restart the HTTP server.

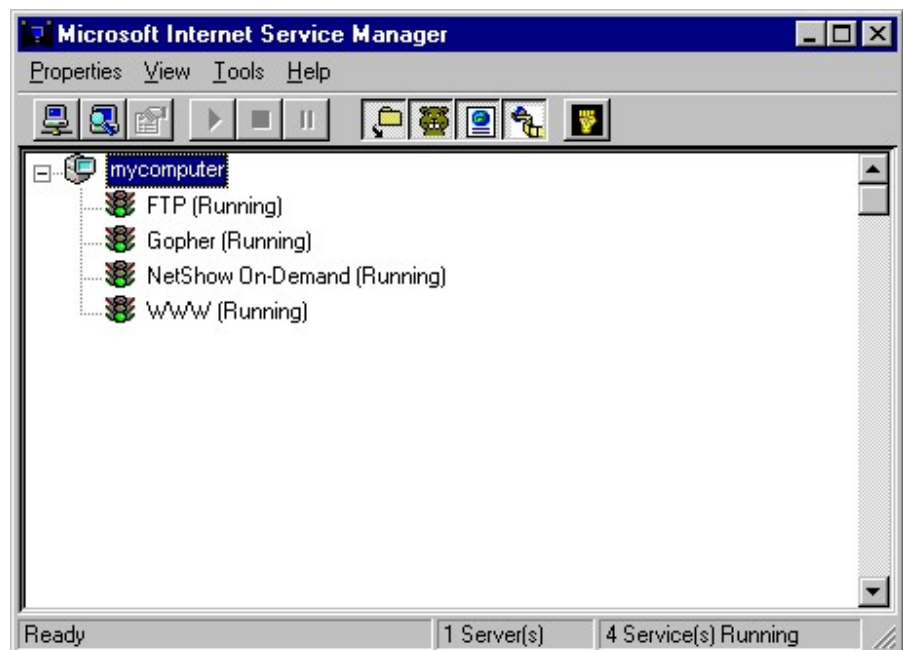
The generic settings are:

MIME type: video/x-ms-asf

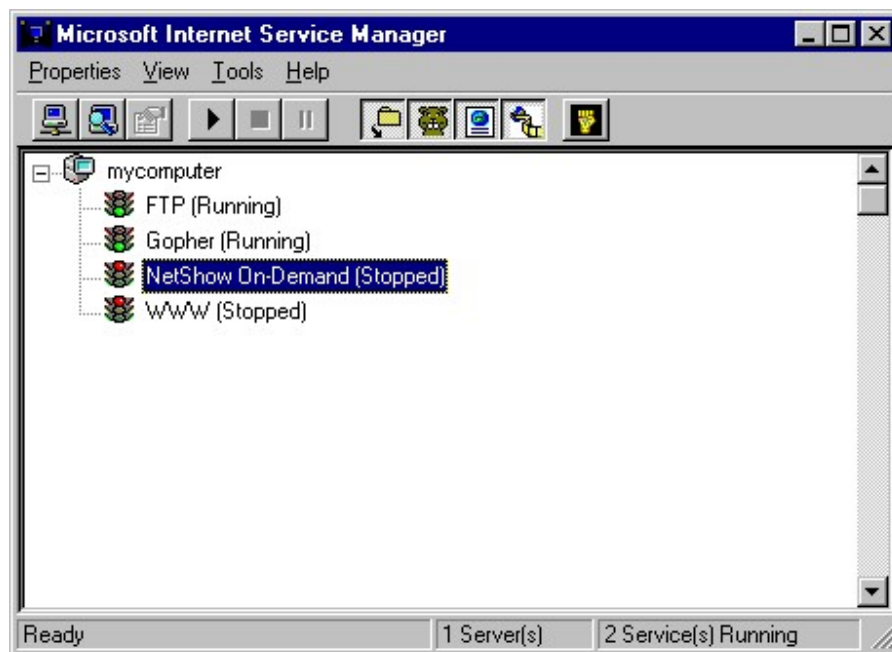
Extensions: asf, asx

Uninstalling Software

- To stop NetShow On-Demand services
 1. On the Windows NT **Start** menu, point to **Programs**, point to **Microsoft Internet Server**, and then click **Internet Service Manager**.
 2. In the **Microsoft Internet Service Manager** dialog box, open the directory listing under the server computer.



3. Highlight NetShow On-Demand, then click the **Stop** button on the toolbar to stop NetShow On-Demand services. Then do the same thing for WWW services.

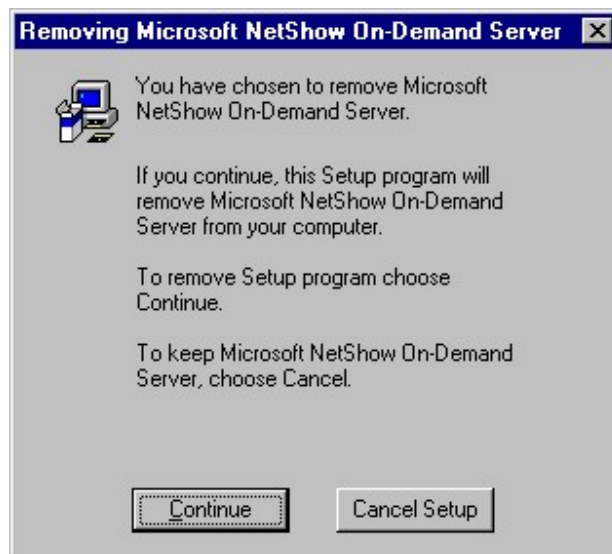


- **To uninstall Microsoft NetShow On-Demand Server and Admin Tools**

Note

Make sure you've stopped all services as shown in "To stop NetShow On-Demand services."

1. On the Windows NT Start menu, point to Programs, point to Microsoft NetShow On-Demand, and then click Remove On-Demand Server and Admin Tools.



2. In the **Removing Microsoft On-Demand Server** dialog box, click **Continue** to remove the server and tools.

–Or–

Click **Cancel** if you decide not to uninstall at this time.



3. Click **OK** when uninstall finishes.

CHAPTER 4

Server Administration

NetShow On-Demand Server includes the following tools for system monitoring and management:

- Internet Information Server (IIS) Internet Service Manager Add-In
- Windows NT Performance Monitor counters
- Windows NT Event Viewer log entries
- Microsoft NetShow On-Demand Trace Facility
- Microsoft NetShow On-Demand Log Facility

After you set up and configure the server, you can use Performance Monitor counters to monitor server performance, and the IIS Internet Service Manager Add-In to view and edit server configuration parameters, for example.

You can also change the maximum bandwidth that NetShow On-Demand Server will stream. This may be useful if you believe the performance of other applications running concurrently on your network is being affected by NetShow On-Demand traffic, or if you find that streaming media presentations are not performing satisfactorily.

This chapter presents information on the following topics:

- Using IIS Internet Service Manager Add-In
- Using Windows NT Performance Monitor Counters
- Using Windows NT Event Viewer Logs
- Using Microsoft NetShow On-Demand Trace Facility
- Using Microsoft NetShow On-Demand Log Facility

Using the NetShow On-Demand Server Administration Tools

The following table briefly describes the server management tools available on a NetShow On-Demand system.

Tools	Description
IIS Internet Service Manager Add-In	Starts and stops the NetShow On-Demand server, monitors server performance, and sets server configuration parameters.
Windows NT Performance Monitor	Tracks and charts NetShow On-Demand performance counters.
Windows NT Event Viewer	Stores event alerts from the NetShow On-Demand system. The Event Viewer's Event Log tool is used for logging critical system errors or failures.
NetShow On-Demand Trace Facility	Monitors the NetShow On-Demand system for the occurrence of irregular events, based on the types of events the network administrator selects to be logged—Administrative, Client, Alert, or Server events.
NetShow On-Demand Log Facility	Receives events from a NetShow On-Demand server and redirects them to a Data Access Objects (DAO) object for data analysis. The resulting .mdb file can be opened in Microsoft Access.

The following sections present a description of the monitoring and administration tools included with NetShow On-Demand Server, and procedures for using the tools.

Note

Administrative privileges are required to manage NetShow On-Demand servers.

Using IIS Internet Service Manager Add-In

The IIS Internet Service Manager Add-In is a tool that is integrated with the IIS 2.0 Internet Service Manager application. Using this tool, network administrators can perform the following tasks:

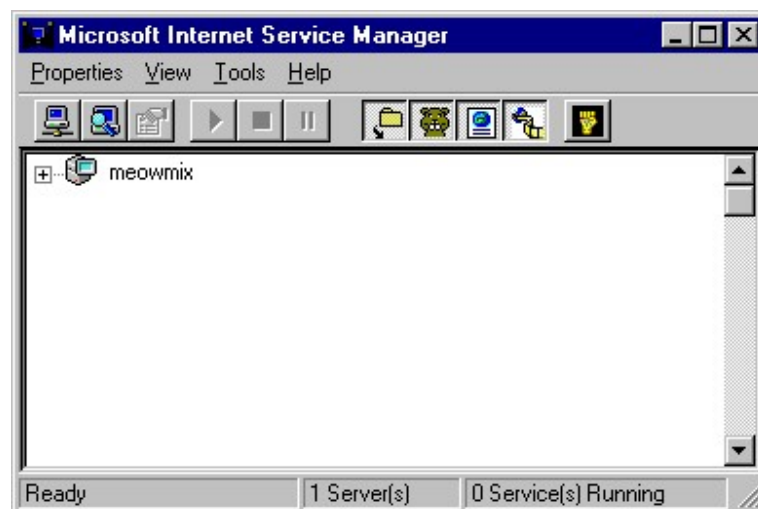
- Start and stop a NetShow On-Demand server.
- Monitor the status of one or all NetShow On-Demand servers in a domain.
- Monitor and set server configuration parameters for local and remote systems, for example, to limit the maximum number of users allowed to access the server.
- Create virtual root directories for storing NetShow On-Demand Server content.

Note that Internet Service Manager uses the Windows NT security model, so only validated administrators are allowed to administer services, and administrator passwords are transmitted in encrypted form over the network.

Starting the Internet Service Manager Add-In

- **To start the Internet Service Manager Add-In**
 - On the **Start** menu, point to **Programs**, and click **Microsoft Internet Server**. In the Microsoft Internet Server folder, click Internet Service Manager.

The **Microsoft Internet Service Manager** window is displayed.

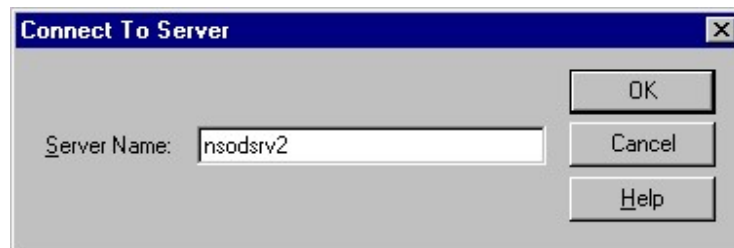


Connecting to a Microsoft NetShow On-Demand Server

- **To connect to a remote server**

1. Click **Connect to Server** on the **Properties** menu or click the **Connect** button on the toolbar.

The **Connect to Server** dialog box appears.



2. In the **Server Name** text box, type the name of the Microsoft NetShow On-Demand server. For example, if your server's name is **nsodsrv2**, type **nsodsrv2**.
3. Click **OK** to connect to the specified server.

To close the dialog box without connecting to the server, click **Cancel**.

Starting and Stopping a Microsoft NetShow On-Demand Server

You can use the Internet Service Manager Add-In to start and stop a selected NetShow On-Demand server.

- **To start a NetShow On-Demand server**

1. Highlight the server you want to start from the **Computer** list on the main Internet Service Manager window.



2. On the Internet Service Manager toolbar, click the **Play** button.

–Or–

On the **Properties** menu, click **Start Service**.

Note that the **Pause** button functionality is not supported.

- **To stop a NetShow On-Demand server**

1. Highlight the server you want to stop from the **Computer** list on the main Internet Service Manager window.



2. On the Internet Service Manager toolbar, click the **Stop** button.

–Or–

On the **Properties** menu, click **Stop Service**.

Displaying Microsoft NetShow On-Demand Servers



- **To display Microsoft NetShow On-Demand servers**
 - Click the **Microsoft NetShow On-Demand Servers** button on the toolbar.
 - Or–
 - On the **View** menu, click **NetShow On-Demand**.

This will display a list of servers in the main Microsoft Internet Service Manager window.

Displaying Other Types of Servers

- **To view other server types**
 - From the **View** menu, choose the server type (or types) you want to monitor: FTP, Gopher, WWW, Microsoft NetShow On-Demand, or All.

Finding All Microsoft NetShow On-Demand Servers on a Domain

- **To find all Microsoft NetShow On-Demand servers**
 - Click **Find All Servers** on the **Properties** menu.

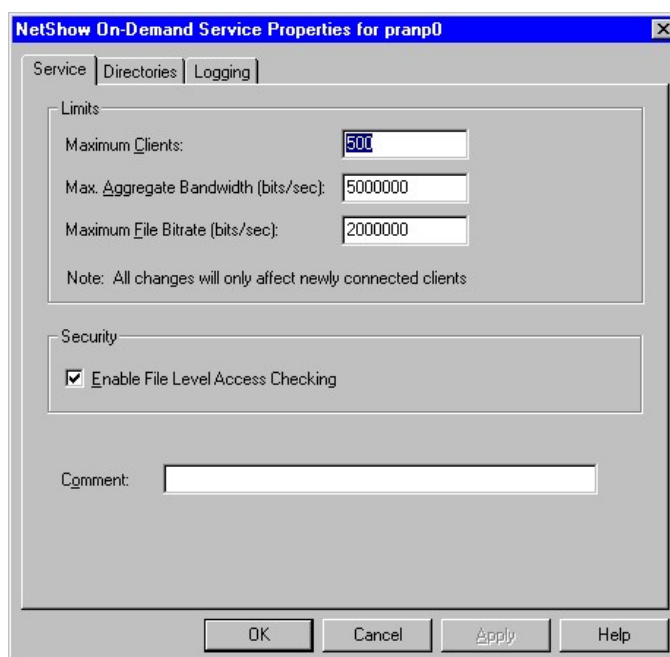
This will bring up a dialog box and start the process of finding all server types that you have selected to view. Typically, administrators monitor all server types: FTP, Gopher, WWW, and Microsoft NetShow On-Demand servers. The search results are displayed in the main Microsoft Internet Service Manager window.

Configuring a NetShow On-Demand Server

- To set server configuration parameters

1. Click **Service Properties** on the **Properties** menu.

This will display the **NetShow On-Demand Service Properties** dialog box.



2. In the **NetShow On-Demand Service Properties** dialog box specify the **Service** options you want to set.

The **Service** tab options are described in the following table.

Option	Description
Maximum Clients	This limits the number of clients that can be connected to the server at any given time. Minimum = 0 Maximum = 10,000
Maximum Aggregate Bandwidth	This limits the amount of bandwidth that the server will stream. Units are in bits/second. The upper limit should not exceed 85% of the capacity of the network interface card. Minimum = 0 Maximum = 100 Mbps (or 100 * 1,024 * 1,024 bps)

Option	Description
Maximum File Bitrate	This limits the amount of bandwidth at which any one file can be streamed. Units are in bits/second. Minimum = 0 Maximum = 6 Mbps (or 6 * 1,024 * 1,024 bps)
Enable File Level Access Checking	If enabled, this checks that the client accessing the .asf file has Windows NT access rights—it checks Windows NT Access Control. Note that disabling this option can increase server performance. Network administrators can use Event Viewer to monitor occurrences of clients not being able to connect to a server because they do not have Windows NT access rights.
Comment	This 260-byte field allows a user to enter text comments for the selected server.

For information regarding setting bandwidth limits, see the section on “Performance Considerations” in Chapter 2, “Setting Up your Server.”

3. Click **OK** to save the specified options and close the dialog box.

To apply the changes and keep the dialog box open, click **Apply**. To cancel the changes and close the dialog box, click **Cancel**.

Adding a Virtual Root Directory for Content

Using Internet Information Server (IIS), network administrators can create a virtual tree of Web aliases built from local directories, allowing them to distribute their Web content files across volumes of the NetShow On-Demand server. The server retrieves content files from local directories based on the virtual tree configuration when it receives HTTP, FTP, Gopher or NetShow On-Demand requests.

Using virtual trees provides the following benefits:

- It makes it easy to stage new Web content for testing over the server without having to copy files back and forth. For example, when a new version of a content file is ready, the administrator need only change an internal path name, and all future requests for content with a particular virtual root name will be satisfied against the new path.
- It allows servers with WWW, FTP, Gopher, and NetShow On-Demand content to be isolated from the Internet—Internet Information Server retrieves and serves documents securely using Windows NT file sharing while exposing other computers in the local area network to low risk of compromise by outside intruders.

- It eliminates the need to change the directory path information within Web pages and applications so administrators can easily move NetShow On-Demand content to larger storage devices. For example, when the storage needs for a single device outstrip that device's capacity, an administrator can attach a larger device, copy NetShow On-Demand content to the new device, and change the virtual root alias to point to that new device—the change is made instantaneously without any need to change the path names within Web pages or applications.

Virtual root directories can be configured from the Microsoft Internet Service Manager, on the Directories pages of the NetShow On-Demand, FTP, WWW, and Gopher service property sheets. The page lists all configured virtual directories.

For more information on virtual root directories, see Chapter 5, "Server Content Management."

Note

When creating a virtual root directory, you must use a *unique* name for the virtual root directory alias. If you use the same name for more than one virtual root directory, only the last entry will be preserved.

Note that the name of the virtual root directory alias must also be different from those of any subdirectories of the home root directory. The reason for this is explained in the following examples.

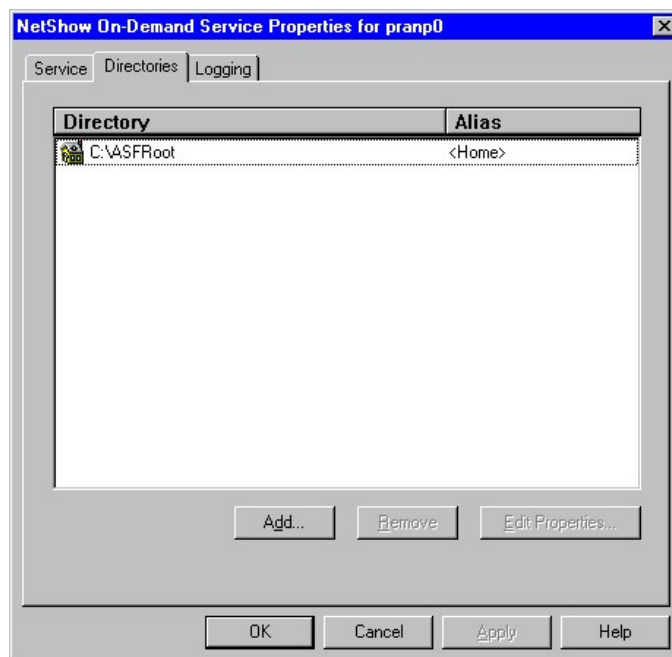
Suppose that you have the following scenario: your home root directory contains a subdirectory called *samples*, you also have a virtual root directory alias named *samples*, and you have a file called *sample.asf* that resides in both *samples* directories. The URL you would use to access either of the *sample.asf* files would be the same: `mms://servername/samples/sample.asf` (where *servername* represents the name of the NetShow On-Demand Server). In this case, NetShow On-Demand Server will stream the *sample.asf* file in the virtual root directory.

As another example, suppose that *sample.asf* resides in the *samples* home root subdirectory only. The URL for it would be `mms://servername/samples/sample.asf`. In this case, NetShow On-Demand Server will display a message indicating that the URL given used an invalid name (this is because the NetShow On-Demand Server will *not* look for the file in the *samples* home root subdirectory).

If the virtual root directory alias you specify does not exist, the alias will be added, but you will need to create the directory.

- **To create a virtual root directory**

1. In the NetShow On-Demand Service Properties dialog box, click the Directories tab.

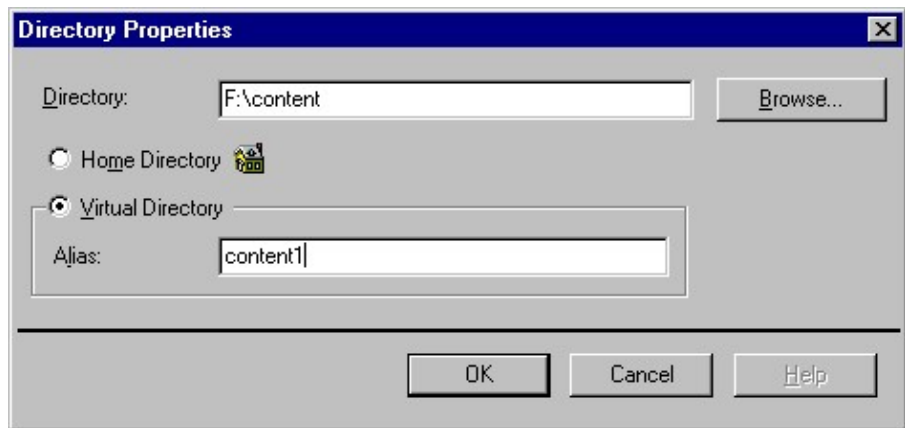


The **Directories** options are described in the following table.

Option	Description
Add	Creates a new virtual root directory in which to store NetShow On-Demand content.
Remove	Removes a currently configured virtual root directory.
Edit Properties	Edits properties of an existing virtual root directory.

- From the **Directories** tab in the **NetShow On-Demand Service Properties** dialog box, click **Add**.

The **Directory Properties** dialog box is displayed.



The **Directory Properties** dialog box options are described in the following table.

Option	Description
Directory	Type the path to a NetShow On-Demand content directory on the local machine.
Browse	Browse to select a NetShow On-Demand content directory.
Home Directory	Set the current path as the Home directory for NetShow On-Demand content.
Virtual Directory (Alias)	Enter an alias name for the NetShow On-Demand server content path. Maximum length is 256 bytes; no spaces.

- After you specify the options you want to apply, click **OK**.
To cancel the changes and close the dialog box, click **Cancel**.

Editing a Virtual Root Directory for Content

- To edit a virtual root directory**

- From the **Directories** tab in the **NetShow On-Demand Service Properties** dialog box, click **Edit Properties**.

The **Directory Properties** dialog box is displayed (the **Directory Properties** dialog box options are described in the preceding procedure). You can use this dialog box to specify the path to the NetShow On-Demand content directory, edit the virtual directory name, and browse to select a content directory.

- Click **OK** to apply the specified options and close the dialog box.

To cancel the changes and close the dialog box, click **Cancel**.

Configuring Internet Service Manager Add-In Logging Options

You can use the Internet Service Manager Add-In **Logging** property to log NetShow On-Demand service activity. The logging data you obtain can be used to assess how NetShow On-Demand Server has been accessed: who the users are, the number of times it has been accessed, and so on.

You can configure logging options to specify the following:

- The directory in which the logs will be stored
- The frequency at which logs are to be rotated (daily, weekly, monthly, and so on)

Note

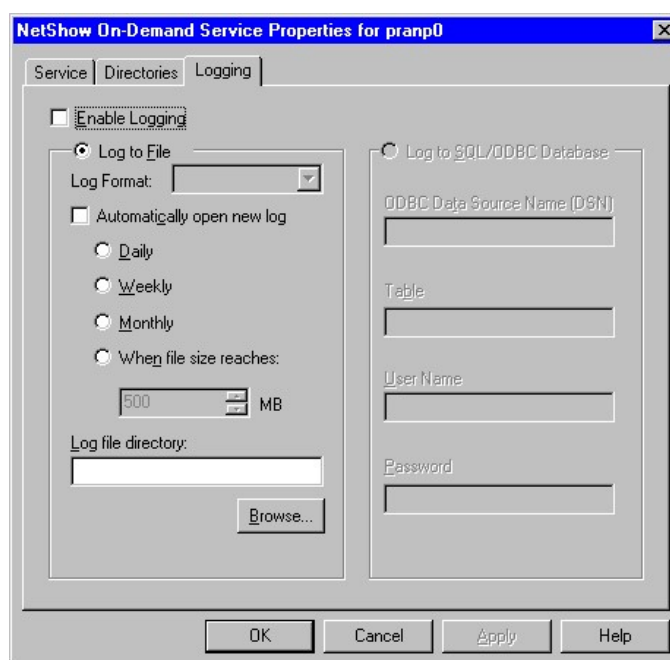
The NetShow On-Demand Server version 1.0 release does *not* support the logging to SQL or ODBC databases or Log Format. These options will be implemented in future releases of the product.

- **To set logging options**

1. In the Internet Service Manager window, click **Service Properties** on the **Properties** menu.

This will display the **NetShow On-Demand Service Properties** dialog box.

2. In the NetShow On-Demand Service Properties dialog box, click the Logging tab.



The **Logging** dialog box options are described below.

Option	Description
Enable Logging	This option starts or stops logging. By default, Enable Logging is disabled.
Log to File	This option logs data to a text file. When logging to a file, the maximum total log line is 512 bytes.
Automatically open new log	This option generates new logs using the specified frequency. If not selected, the same log file will grow indefinitely. The default option for this field is Daily . (Note that a new log file is generated each time the service starts, regardless of this setting.) For the Daily , Weekly , or Monthly options, the log file is closed the first time a log record is generated after midnight on the last day of the current log file. The service will close the log file and create a new one

Option	Description
	with a different name in the same folder when the appropriate interval or file size is reached. The log file name is: NSOSrv.yymmddnnn.log where: yymmdd is the year, month, and day when the log file is created nnn is a sequentially increasing number that represents the number of logs generated so far on the current date (this is so you can start and stop the NetShow On-Demand Server without overwriting or appending to the old log file).
Log file directory	This option specifies the server directory containing the log file. By default, the directory used is C:\<windows_directory>\System32\Logfiles. Note that even if you are using a remote machine, the path you enter here is a NetShow On-Demand server path.
Browse	Browse the <i>local</i> server. Note that data gets logged to the local server.

3. Specify the logging options you want to use, and click **OK** to apply the settings and close the dialog box.

To apply the settings without closing the dialog box, click **Apply**. To cancel the settings and close the dialog box, click **Cancel**.

Entries in the log currently have the following layout:

A B C D E F G H I J K L M N O P
 Q R S T U V W X

22:17:00, 11, 5, 87500, 157.56.138.81, c:\asfroot\100.asf, 31, 0, 44, 0x0, 31, 0, 0, 20, 42, 60, MSCCORE NT 4.0.1381, 90, 5, 5, 1, 95

The next section provides a description of the log fields.

Server Statistics

Server statistics apply to the time at which the log entry was made.

Column	Description
A	Server local time
B	The number of connected clients
C	The number of active streams
D	The allocated bandwidth

Client and Stream Statistics

Client and stream statistics apply to the most recently terminated streaming session for the specified client.

Column	Description
E	The IP address of the client (from the server's perspective).
F	The name of the file that was streamed.
G	The number of packets sent to the client.
H	The number of packets skipped
I	The ideal (full pipe) packet duration in msec. This is ((packet size) / rate) for the file.
J	The HRESULT for the termination of the streaming session. HRESULT represents an error code. For information on server errors, see "Server Error Messages."
K	The number of packets the client received.
L	The number of erasures detected by the client. Contiguous erasures refers to the number of contiguous packets recovered. This value represents the worst case scenario.
M	The maximum number of contiguous erasures detected by the client, where contiguous erasures refers to contiguous packets dropped by the server.
N	The minimum packet period. This is the minimum interval in msec between packet arrivals. This value is accurate only to within approximately 10 msec, and is meaningful only if the pipe is full.
O	The average packet period. This is the average interval in msec between packet arrivals. This value is accurate only to within approximately 10 msec. This value is meaningful only if the pipe is full; if the pipe is full, this value should be approximately equal to packet duration.
P	The maximum packet period. This value is accurate only to within approximately 10 msec, and is meaningful only if the pipe is full. This value represents the maximum interval between packet arrivals (in msec).
Q	The name of the client module that reported these statistics.
R	The client operating system abbreviation (currently supports only Windows NT or Windows 95).
S	The operating system version (major.minor.build number).
T	The total number of packets received during this playback.
U	The total number of packets recovered through error correction during this playback.
V	The total number of packets lost during this playback.
W	The number of times the client buffered during this playback (1 is normal).
X	The minimum reception quality (percentage of non lost packets over the last 30 seconds) recorded during this playback.

The following is an example of a log file line:

```
14:28:56, 1, 0, 193750, 157.56.137.30, C:\ASFRoot\tori.asf, 84, 0, 100, 0x0, 84, 0, 0, 70, 98, 131, MSCCORE NT 4.0.1381, 84, 0, 0, 1, 100
```

The file played was C:\ASFRoot\Tori.asf, the server sent 84 packets and skipped none, and the client received all 84 packets, achieving 100% minimum reception quality.

Using Performance Monitor Counters

NetShow On-Demand Server includes a custom set of Windows NT performance counters that network administrators can use to monitor the performance of the server and measure how efficiently it is functioning.

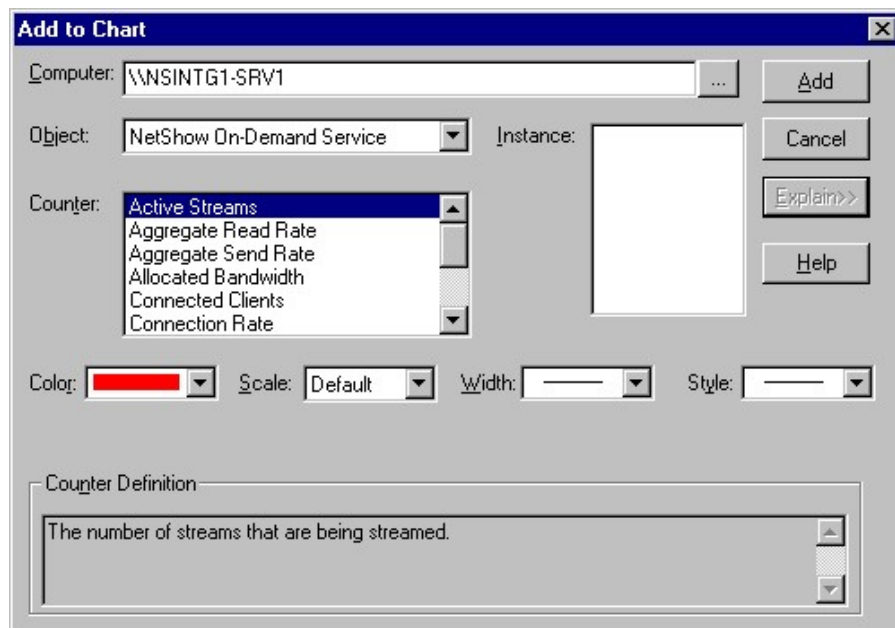
Viewing Performance Counters

NetShow On-Demand includes the **NetShow On-Demand Service** object and its associated counters that you can use to monitor, for example, the amount of bandwidth allocated to clients or the number of streams being sent to clients.

This section presents two methods for viewing the NetShow On-Demand Server performance counters: using NetShow On-Demand Performance Monitoring Settings in the Microsoft NetShow group, and using Performance Monitor in the Windows NT Administrative Tools group. The first method utilizes the Nsoperf.pmc file—this file contains a custom set of performance counters that are specific to NetShow On-Demand.

- **To view the performance counters using On-Demand Performance Monitoring Settings (in the Microsoft NetShow group)**
 - On the **Start** menu, point to **Programs**, and click **Microsoft NetShow**. In the Microsoft NetShow folder, click **On-Demand Performance Monitoring Settings**. This will display the Performance Monitor window with the Nsoperf.pmc file settings, which include the NetShow On-Demand Service counters, described later in this section.

- **To view the performance counters using Performance Monitor (in the Administrative Tools group)**
 1. On the **Start** menu, point to **Programs**, and click **Administrative Tools**. In the Administrative Tools folder, click **Performance Monitor**.
The **Performance Monitor** window is displayed.
 2. On the Performance Monitor **Edit** menu, click **Add to Chart**.
The **Add to Chart** dialog box is displayed.



3. Select NetShow On-Demand Service in the **Object** drop-down list.
4. Select each NetShow On-Demand Service performance counter you want to use, and click **Explain** for a description of the counter.
5. Click **Add** with the performance counter selected to add the counter to the chart.
You can optionally scale the performance counters from this dialog box. When selecting a scale factor, you may want to take into account the bandwidth you plan on supporting and the readability of the chart.
6. After selecting the counters, click **Done**.

Performance Counter Descriptions

The following table provides a list and description of each of the NetShow On-Demand Server performance counters (listed in order of appearance).

Performance counter	Description
Active Streams	Number of active files, or streams, currently being sent to NetShow On-Demand Players. Provides an overall indicator of system activity. Note that a client is still connected even if it has stopped playing a file—this is because the NetShow On-Demand Server will maintain the bandwidth allocation to that client for 60 seconds after the client stops playing (this is called the Client Inactivity Timeout period). After the Client Inactivity Timeout period has elapsed, the server actively checks the client's status by periodically sending a message to each client. The server will keep a client connection open as long as the client responds to a message within three minutes (this is called the Client Terminal Timeout).
Aggregate Read Rate	Sum, in bytes per second, of the read rates for all files being sent to NetShow On-Demand Players. Indicates the speed at which the server is reading data from disk. The graph usually appears jagged because reads are faster than sends.
Aggregate Send Rate	Sum, in bytes per second, of the send rates for all files being sent to NetShow On-Demand Players. Indicates the speed at which the server is sending data to NetShow On-Demand Players. The graph should appear relatively smooth; a jagged graph may indicate bandwidth contention.
Allocated Bandwidth	Amount of bandwidth that the server allocates, based on the number of currently connected NetShow On-Demand Players. Generally, clients connected to NetShow On-Demand and not receiving streams are still allocated bandwidth. If a NetShow On-Demand Player has allocated bandwidth but does not send a command during the Client Inactivity Timeout period, its bandwidth is deallocated. Client Inactivity Timeout period = 60 seconds.
Connected Clients	Number of client programs currently connected. Indicates all NetShow On-Demand Players connected to the system. This includes clients streaming, clients in paused and connected states, and clients that the server has not yet detected as being disconnected. The latter may occur if a client has lost power or disconnected from the network and has not been able to notify the server of termination. After the Client Inactivity Timeout period has elapsed (60 seconds), the NetShow On-Demand Server actively checks the client's status by periodically sending a message to each client.

Performance counter	Description
	Clients must reply to the message within three minutes in order to maintain their connection to the server (this is called the Client Terminal Timeout).
Connection Rate	The rate at which clients are connecting to the server. This is used to gate the number of instantaneous connections being serviced by the server. The default is 10 connections per second. This counter is useful for correlating client connections with system resource utilization.
Late Reads	The number of late read completions per second. A late read is a disk read operation that takes significantly longer than expected to complete. Typically, this counter is nonzero only when the server is under a very heavy load. If this counter is often nonzero, it could indicate that the system is not properly configured (for example, you may need to use additional hard drives, or use a lower setting for the maximum number of clients), or that other applications are competing with NetShow On-Demand for the use of the disk.
Scheduling Rate	Rate at which requests are being made for tasks to be scheduled, in tasks per second. The only tasks that are currently scheduled are writes to the network. The scheduling rate is roughly proportional to the rate at which packets are being sent by the server (this rate does not represent a one-to-one correspondence).
Stream Errors	The number of errors occurring per second. Stream errors represent the number of stream data packets discarded by the server. They are introduced by the server when it cannot keep up with the demand for data and must throw some packets away in order to avoid running behind schedule indefinitely. Stream errors show up most often after late reads occur. They are an indication that the system is not properly configured, or that other applications are competing for system resources (CPU, disk, RAM). Heavy network traffic can also contribute to stream errors.
Stream Terminations	The rate at which streams are terminated due to errors. Stream terminations are an indication that the system is not properly configured, or that the file being streamed is corrupt. The server will unilaterally terminate a stream under certain circumstances. The most common occurrence of stream termination is when the server is running significantly behind schedule. If the server must throw away several packets in a row from a given stream in order to remain on schedule, it will terminate the stream. Streams can also be terminated if invalid data is encountered during file streaming.

Using Windows NT Event Viewer Logs

The Windows NT Event Viewer log can be used for displaying information that needs to be evaluated over longer periods of time or to show critical events. The Event Log is used for logging critical system errors or failures and system state changes. The Event Log is *not* used for viewing events that typically occur more than two or three times a day, for example, for viewing client connects and disconnects. This is for the following reasons:

- If events that occur many times a day are logged, it may obscure important information about system failures.
- The NetShow On-Demand server is intended to remain running for long periods of time. A log would fill up too quickly if frequently occurring events were logged.

Supported Alerts

Event notification can be used for updating parameters of interest to an administration application. The following are the supported alerts:

- “The NetShow On-Demand service started.”
- “The NetShow On-Demand service stopped.”

Using the NetShow On-Demand Trace Facility

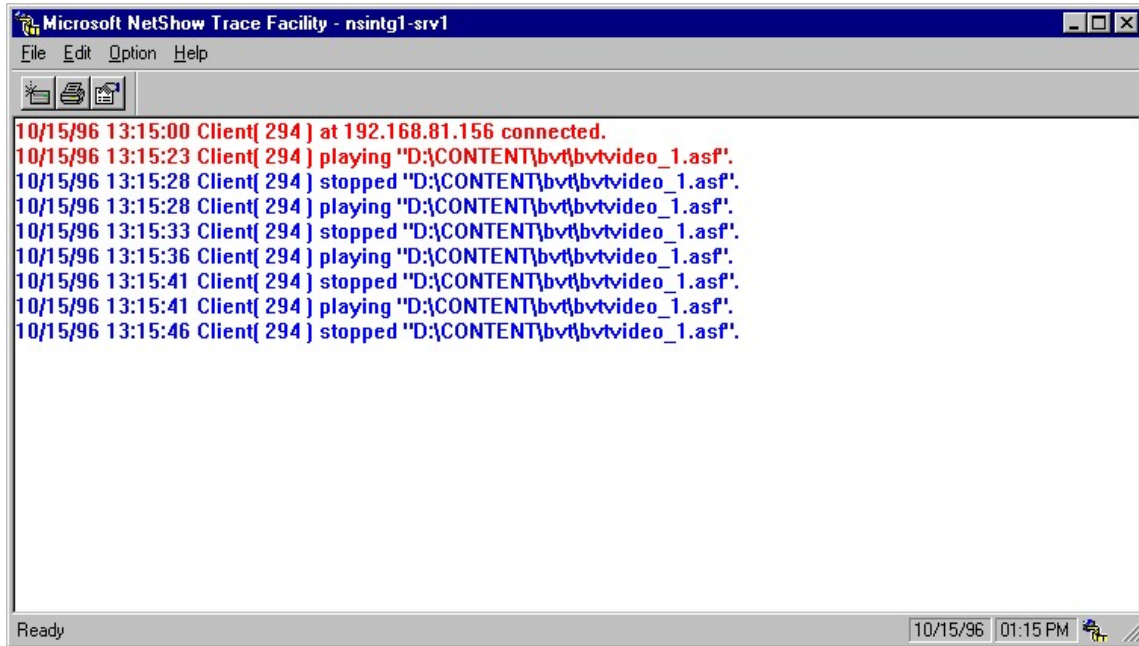
The NetShow On-Demand Trace Facility is a tool that network administrators can use for monitoring and troubleshooting the server. For example, the tool can be used to look for occurrences of irregular events, or for troubleshooting server problems by observing the response to a particular action on the server. Note that you need to have administrative access to the server to use the NetShow On-Demand Trace Facility.

The server trace log consists of a window that is similar to a console. Events appear as text messages in the window.

The NetShow On-Demand Trace Facility has the following capabilities:

- Allows users to connect to any NetShow On-Demand server on the same NT domain.
- Can be configured to display from 10 to 10,000 lines (the default is 1,000).
- Filters out messages according to their type: Server, Client, Alert, and Administrative.
- Allows users to change the color of messages based on message type and the message font, and clear the display.
- Properties entered into the NetShow On-Demand Trace Facility are persistent—every time the application is started, the user can begin tracing without resetting the server name, filters, color and font options, and so on.

The NetShow On-Demand Trace Facility window is shown below.



Starting the NetShow On-Demand Trace Facility

- To start the NetShow On-Demand Trace Facility
 - Click **Start**, point to **Programs**, and click the Microsoft NetShow folder. In the Microsoft NetShow folder, click **On-Demand Trace Facility**.
- The Microsoft NetShow Trace Facility window is displayed.

Connecting to a NetShow On-Demand Server

- To connect to a server
 1. On the **File** menu, click **Connect to Server**.
–Or–
Click the **Connect** button on the toolbar.
The **Connect to Server** dialog box appears.
 2. In the **Server Name** text box, type the name of the NetShow On-Demand server.
 3. Click **Connect** to connect to the specified server. The server name appears in the window's title bar.
Press **Cancel** to close the dialog box without connecting to the server.

Pausing the Screen from Trace Log Messages

- **To pause the screen from scrolling trace log messages**
 - On the NetShow On-Demand Trace Facility window, click the Up scroll arrow of the vertical scroll bar or move the tab on the vertical scroll bar up. The screen stops scrolling, but new messages continue to be added to the bottom of the list.

Saving Trace Log Files

- **To save the trace log as a text file**
 - On the **File** menu, click **Save As**.

The **Save As** dialog box appears. By default, the NetShow On-Demand Trace Facility saves the log as a .txt file with line breaks. When this option is selected, a snapshot of the NetShow On-Demand Trace Facility window is written to a text file. To save additional messages, click **Save As** again. To save selected messages, highlight the messages you want to save, and click **Save As**.

You can use a text editor such as Notepad to open and view the log .txt file.

Printing Trace Log Files

- **To print the trace log**
 - On the **File** menu, click **Print**.

The **Print** dialog box appears, where you can specify the print options for your document.

—Or—
 - Click the Print icon on the toolbar to print the contents of the NetShow On-Demand Trace Facility window. This option prints using the current print settings.

Displaying or Hiding the Toolbar

- **To display or hide the toolbar**
 - On the **Option** menu, click **Toolbar**. A check mark next to **Toolbar** indicates that the toolbar is activated.

Displaying or Hiding the Status Bar

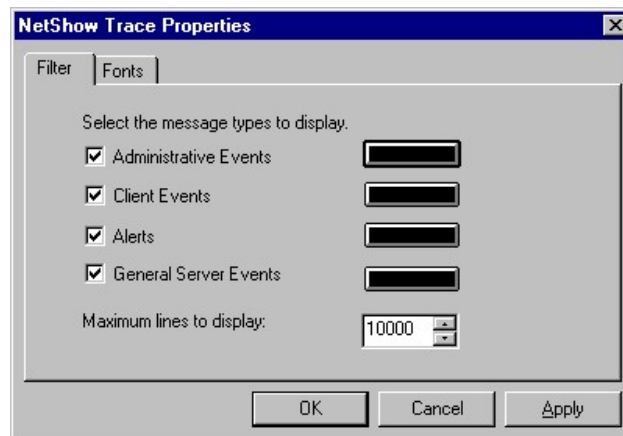
- **To turn the status bar on or off**
 - On the **Option** menu, click **Status Bar**. A check mark next to **Status Bar** indicates that the status bar is activated.

Clearing a Trace Log

- **To clear the trace log**
 - On the **Option** menu, click **Clear Log**.
All log messages are removed from the window.

Filtering Trace Log Messages

- **To filter trace log messages**
 1. On the **Option** menu, click **Properties**.
–Or–
Click the **Properties** button on the toolbar
The **NetShow Trace Properties** dialog box is displayed.



2. In the **NetShow Trace Properties** dialog box, click the **Filter** tab.
By default, the foreground color for the system is set to black, and you can change that to associate an event with a particular color. To change the color associated with an event, click the color bar next to the event type. This will display the **Color** dialog box, where you can select the color you want to use. Click **OK** to activate the change.
3. Select the message types you want to display by selecting one or more of the following check boxes: **General Server Events**, **Client Events**, **Administrative Events**, or **Alerts**. You can also assign a color to each message type.
4. Click **OK** to activate the message filter options.
Only messages of the types you specified are displayed in the window. Press **Cancel** to close the dialog box without changing the message filter.

Changing the Font

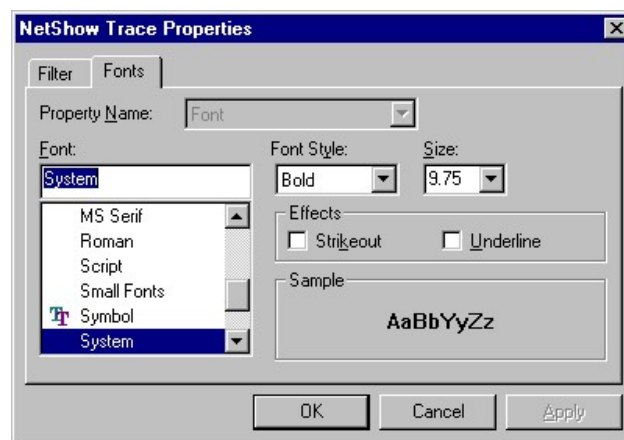
- To change the font

1. On the **Options** menu, click **Properties**.

The **NetShow Trace Properties** dialog box is displayed.

2. In the **NetShow Trace Properties** dialog box, click the **Fonts** tab.

The default font for all filter types is System, Bold, 9.75 point.



3. Select a font, font style and size, and click **OK** to change the font.

Font changes will affect only new messages. To apply the font changes without closing the dialog box, click **Apply**. To close the dialog box without changing the font, click **Cancel**.

Message Types

The NetShow On-Demand Trace Facility logs the following messages based on the event types that the user has selected to log.

For time and date output formats, the Trace Facility utilizes the current user settings for start date and start time (configured with the Date/Time application in the Windows NT Control Panel). Time is converted to the local time zone settings.

Event	Type	Message
OnServerOnline	Server	" <i>Timestamp ServerName</i> Media server online."
OnServerOffline	Server	" <i>Timestamp ServerName</i> Media server offline."
OnClientConnect	Client	"<i>Timestamp</i> Client (<i>ordinal</i>) at <i>ClientIP</i> connected." Where: <i>ordinal</i> = integer assigned to a client that is connected <i>ClientIP</i> = client's IP address For example, "9/26/96 23:59:00 Client (1) at 192.168.81.156 connected."
OnClientDisconnect	Client	"<i>Timestamp</i> Client (<i>ordinal</i>) at <i>ClientIP</i> disconnected." Where: <i>ordinal</i> = integer assigned to a client that is connected <i>ClientIP</i> = client's IP address For example, "9/26/96 23:59:00 Client (1) at 192.168.81.156 disconnected."
OnClientPlay	Client	"<i>Timestamp</i> Client (<i>ordinal</i>) playing "<i>TitleName</i>"." Where: <i>ordinal</i> = integer assigned to a client that is connected <i>TitleName</i> = file name and path For example, "9/26/96 23:59:00 Client (1) playing "c:\asfroot\demo.asf"."

Event	Type	Message
OnClientStride	Client	“<i>Timestamp</i> Client (<i>ordinal</i>) seeking in “<i>FileName</i>”.” Where: <i>ordinal</i> = integer assigned to a client that is connected <i>FileName</i> = file name and path For example, “9/26/96 23:59:00 Client (1) seeking in “c:\asfroot\demo.asf”.”
OnClientStop	Client	“<i>Timestamp</i> Client (<i>ordinal</i>) stopped “<i>FileName</i>”.” Where: <i>ordinal</i> = integer assigned to a client that is connected <i>FileName</i> = file name and path For example, “9/26/96 23:59:00 Client (1) stopped “c:\asfroot\demo.asf”.”
OnAdminClientLimit	Administrative	“<i>Timestamp</i> Administrator set maximum number of clients to <i>MaxClient</i>.” Where: <i>MaxClient</i> = current setting for maximum number of clients.
OnAdminFileBitRateLimit	Administrative	“<i>Timestamp</i> Administrator set maximum allowable bandwidth per stream to <i>MaxFileBitRate</i>.” Where: <i>MaxFileBitRate</i> = the current setting for maximum bandwidth per stream (for example, 2 Mbps)
OnAdminBandwidthLimit	Administrative	“<i>Timestamp</i> Administrator set the maximum allowable bandwidth to <i>MaxBandwidth</i>.” Where: <i>MaxBandwidth</i> = the current setting for maximum aggregate bandwidth (for example, 10 Mbps)
OnAdminKillClient Note: This is a future enhancement — this feature is not supported in the version 1.0 release.	Administrative	“<i>Timestamp</i> Administrator disconnected client (<i>ordinal</i>).” Where: <i>ordinal</i> = integer assigned to a client

Event	Type	Message
OnAdminSecurityEnabled	Administrative	“<i>Timestamp</i> Administrator enabled security.” –Or– “<i>Timestamp</i> Administrator disabled security.”
OnMaxClients	Alert	“<i>Timestamp</i> Connection refused. Maximum clients (<i>MaxClients</i>) reached.” Where: <i>MaxClients</i> = the current setting for maximum number of clients
OnMaxBandwidth	Alert	“<i>Timestamp</i> Media server reached maximum allowable bandwidth <i>MaxBandwidth</i> bps.” Where: <i>MaxBandwidth</i> = the current setting for maximum aggregate bandwidth (for example, 10 Mbps or 10 * 1,024 * 1,024 bps).
OnMaxFileBitRate	Alert	“<i>Timestamp</i> Play refused. File exceeds maximum file bitrate <i>MaxFileBitRate</i> bps.” Where: <i>FileName</i> = file name and path <i>MaxFileBitRate</i> = the current setting for maximum file bandwidth (for example, 2 Mbps or 2 * 1,024 * 1,024 bps).

Using the NetShow On-Demand Log Facility

The NetShow On-Demand Log Facility is an application that receives events from a server and redirects them to a Data Access Objects (DAO) database file where the data can be analyzed. The .mdb file can be accessed via Microsoft Access, Microsoft Excel, or any products that can interpret the DAO format. DAO is a high-level set of objects that insulates developers from physical details of reading and writing records. In a database application, for example, DAO objects include table definitions, query definitions, fields, indexes, and so on.

The NetShow On-Demand Log Facility has the following capabilities:

- Connects to any media server on the same Windows NT domain.
- Writes to an .mdb file for a user-configurable number of hours before beginning to overwrite old events. Overwriting uses first in, first out (FIFO) rules for deleting information when the limit is reached.
- Filters messages according to their type: Administrative, Client, Alert, and Server.
- Allows users to connect to NetShow On-Demand servers.
- Allows users to open an existing .mdb file or create one for logging events.

To begin logging events, you must first configure and enable the NetShow On-Demand Log Facility—by default, when you first install the NetShow On-Demand server, the logging option is disabled. A tray icon (located in the Windows NT task bar, where the sound, printer, and time/date icons are located) indicates whether the NetShow On-Demand Log Facility is running. See “Configuring and Starting the NetShow On-Demand Log Facility” later in this section for more information.

After the .mdb log file is created, you can open it in Microsoft Access, analyze the logged information, create log reports, graph the log results, and use the logging information to help you plan for system capacity, for example.

This section describes the default database and table and the event types that you can log, and explains how to use the NetShow On-Demand Log Facility.

Default Database and Table

The NetShow On-Demand Log Facility writes to a default Access database named Nslog.mdb (created in the \Microsoft NetShow\On-Demand\Admin directory) and the default database table name is **NetShow On-Demand Events**.

The following table describes the default database table fields, data types, and data.

Field name	Data type	Data
EventDate	Date/Time	Date/Time
ClientID	Text - field size: 15	IP address
Event Type	Text - field size: 20	Administrative Client Alerts Server
Event Description	Text - field size: 255	See messages description in the “Event Types and Database Values” section.

Database and Table Validation

When you use the **NetShow Log Facility** dialog box to specify the logging settings, you must supply the name of a database (.mdb) file and table to which you want to write log events (defaults for the database and table names are Nslog.mdb and **NetShow On-Demand Events** respectively). The NetShow On-Demand Log Facility validates the settings you enter. If you specify a database name that does not exist, the database is automatically created.

If the .mdb file you specify already has the exact schema and table name as the defaults, new messages are appended to the bottom of the .mdb file. If the .mdb file does not have the table you specify, the table is automatically created.

If the .mdb file has the same table name you specify, with the same fields and field types, but also includes additional fields in the table, records will be appended to the table.

If the .mdb table you specify exists, but the fields do not, they are automatically created. If the fields exist, but they are not large enough, an error message is displayed.

Event Types and Database Values

The following table presents a description of the event types and their database value.

Event

EventType
value

Message

OnServerOnline	Server	“Media server online.”
OnServerOffline	Server	“Media server offline.”
OnClientConnect	Client	“Client (<i>ordinal</i>) at <i>ClientIP</i> connected.” Where: <i>ordinal</i> = integer assigned to a client that is connected <i>ClientIP</i> = client’s IP address For example, “Client (1) at 192.168.81.156 connected.”
OnClientDisconnect	Client	“Client (<i>ordinal</i>) at <i>ClientIP</i> disconnected.” Where: <i>ordinal</i> = integer assigned to a client that is connected For example, “Client (1) at 192.168.81.156 disconnected.”
OnClientPlay	Client	“Client (<i>ordinal</i>) playing “ <i>TitleName</i> ”.” Where: <i>ordinal</i> = integer assigned to a client that is connected <i>TitleName</i> = file name and path For example, “Client (1) playing “c:\asfroot\demo.asf”.”
OnClientStride	Client	“Client (<i>ordinal</i>) seeking in “ <i>TitleName</i> ”.” Where: <i>ordinal</i> = integer assigned to a client that is connected <i>TitleName</i> = file name and path For example, “Client (1) seeking in “c:\asfroot\demo.asf”.”

The following table presents a description of the event types and their database value. Event	EventType value	Message
OnClientStop	Client	“Client (<i>ordinal</i>) stopped “ <i>TitleName</i> ”.” Where: <i>ordinal</i> = integer assigned to a client that is connected <i>TitleName</i> = file name and path For example, “Client (1) stopped “c:\asfroot\demo.asf”.”
OnAdminClientLimit	Administrative	“Administrator set maximum number of clients to <i>NumClient</i> .” Where: <i>NumClient</i> = current setting for maximum number of clients
OnAdminFileBitRateLimit	Administrative	“Administrator set maximum allowable file bandwidth to <i>MaxFileBitRate</i> .” Where: <i>MaxFileBitRate</i> = current setting for maximum aggregate file bandwidth, for example, 6 Mbps or 6 * 1,024 * 1,024 bps.
OnAdminBandwidthLimit	Administrative	“Administrator set maximum allowable bandwidth to <i>MaxBandwidth</i> .” Where: <i>MaxBandwidth</i> = current setting for maximum aggregate bandwidth, for example, 10 Mbps or 10 * 1,024 * 1, 024 bps.
OnAdminKillClient Note: This feature is <i>not</i> supported in the version 1.0 release—it is a future enhancement.	Administrative	“Administrator at disconnected client (<i>ordinal</i>).” Where: <i>ordinal</i> = integer assigned to a client
OnAdminSecurityEnabled	Administrative	“ <i>Timestamp</i> Administrator enabled security.” –Or– “ <i>Timestamp</i> Administrator disabled security.”

The following table presents a description of the event types and their database value.
Event

**EventType
value**

Message

OnMaxClients	Alert	“Connection refused. Maximum client (<i>MaxClients</i>) reached.” Where: <i>MaxClients</i> = the current setting for maximum number of clients
OnMaxBandwidth	Alert	“Media server reached maximum allowable bandwidth <i>MaxBandwidth</i> bps.” Where: <i>MaxBandwidth</i> = current setting for maximum aggregate bandwidth, for example, 10 Mbps or 10 * 1,024 * 1, 024 bps.
OnMaxFileBitRate	Alert	“Play refused. File exceeds maximum file bitrate <i>MaxFileBitRate</i> bps.” Where: <i>TitleName</i> = file name and path <i>MaxFileBitRate</i> = current setting for maximum aggregate file bandwidth, for example, 2 Mbps or 2 * 1,024 * 1, 024 bps.

Configuring and Starting the NetShow On-Demand Log Facility

During NetShow On-Demand server installation, the NetShow On-Demand Log Facility icon is placed in the Windows NT Startup group—the Log Facility is automatically started when you start the server, and the NetShow On-Demand Log Facility icon is displayed in the Windows NT task bar tray, as shown below. To begin logging, you must first enable logging, as explained in the following procedure.



- **To enable logging and configure the NetShow On-Demand Log Facility**

1. In the Windows NT task bar tray, double-click the NetShow On-Demand Log Facility icon.

–Or–

Right-click the NetShow On-Demand Log Facility icon in the Windows NT task bar tray, and click **Properties**.

The **Microsoft NetShow Log Facility** dialog box is displayed.

2. In the **Microsoft NetShow Log Facility** dialog box, specify the options you want to apply.

The **Microsoft NetShow Log Facility** options are described in the following table.

Option	Description
Enable Logging	Select this check box to enable the logging process. By default, this check box is cleared.
Server to monitor	Type the name of the NetShow On-Demand server you want to monitor. The default for the server name is NULL ("").
Select or create an Access database	The default database name, Nslog.mdb,

Option	Description
	is displayed. To specify a different database name, click Change and type the name and path to the Microsoft Access database you want to use or create. If the database does not exist, the Log Facility will create one.
Type the name for an existing or new table	Type the name of the database table you want to use. If the table you specify does not exist, the Log Facility will create one. The default table name is NetShow On-Demand Events .
Set length of logging time	The default for this field is 48 hours. A value of 0 (zero) will log indefinitely. The maximum value is 1,000 hours. Caution: Specify a nonzero value. Specifying 0 would mean that disk space management is up to the user. Disk space management should be performed only by experienced network administrators.
Select the categories of events to log	Choose the types of events you want to log: Administrative, Client, Alerts, or Server. The default is to log all of these types of events. Administrative events are logged when configuration settings are modified, for example, when the maximum number of clients or maximum bandwidth is modified. Client events are logged, for example, when a client connects or disconnects. Alerts are logged when server configuration settings are reached, for example, when the maximum number of clients is reached. Server events are logged to indicate server status, for example, whether a server is online or offline.

3. Click **OK** to apply the specified settings and close the dialog box.

To apply the specified settings without closing the dialog box, click **Apply**. To cancel the specified settings, click **Cancel**.

When you click **OK** or **Apply**, the NetShow On-Demand Log Facility first validates each of the specified settings. For example, when logging is enabled, it verifies the following: the specified server is running (if the server is not running, it displays an error message); the database (.mdb) file you specified exists (if it does not, it creates one); and the database you specified contains the specified table (if it does not, it creates one).

Connecting to a NetShow On-Demand Server

After the NetShow On-Demand Log Facility has been enabled, the NetShow On-Demand Log Facility icon is displayed in the Windows NT task bar tray as shown below.



- **To connect to a server**

1. In the Windows NT task bar tray, double-click the NetShow On-Demand Log Facility icon.

–Or–

Right-click the NetShow On-Demand Log Facility icon in the Windows NT task bar tray, and click **Properties**.

The **Microsoft NetShow Log Facility** dialog box is displayed.

2. In the **Microsoft NetShow Log Facility** dialog box, type the server name in the **Server to monitor** text box.

3. Click **OK** to connect to the specified server and close the dialog box.

To connect to the server without closing the dialog box, click **Apply**.

Opening a Log File

- **To open a new or existing log file**

1. In the Windows NT task bar tray, double-click the NetShow On-Demand Log Facility icon.

–Or–

Right-click the NetShow On-Demand Log Facility icon in the Windows NT task bar tray, and click **Properties**.

The **Microsoft NetShow Log Facility** dialog box is displayed.

2. In the **Microsoft NetShow Log Facility** dialog box, click **Change**.

The **Database Name** dialog box is displayed.

3. In the **Database Name** dialog box, type a new database name or browse to select an existing .mdb file, and click **Open**.

4. In the **Microsoft NetShow Log Facility** dialog box, click **OK** to open the specified log file and close the dialog box.

To open the specified .mdb file without closing the dialog box, click **Apply**.

Changing the Types of Events to Monitor

- **To change the events you want to monitor**

1. In the Windows NT task bar tray, double-click the NetShow On-Demand Log Facility icon.

–Or–

Right-click the NetShow On-Demand Log Facility icon in the Windows NT task bar tray, and click **Properties**.

The **Microsoft NetShow Log Facility** dialog box is displayed.

2. In the **Microsoft NetShow Log Facility** dialog box, select the event categories you want to monitor: **Administrative**, **Client**, **Alerts**, or **Server**. A check mark next to an event type indicates that the event is selected.

3. Click **OK** to activate the specified changes and close the dialog box.

To activate the specified changes without closing the dialog box, click **Apply**.

Changing the Log Record Limit

- **To change the log record limit (number of hours to log)**

1. In the Windows NT task bar tray, double-click the NetShow On-Demand Log Facility icon.

–Or–

Right-click the NetShow On-Demand Log Facility icon in the Windows NT task bar tray, and click **Properties**.

The **Microsoft NetShow Log Facility** dialog box is displayed.

2. In the **Microsoft NetShow Log Facility** dialog box, type or select the number of hours to log in the **Record Limit (hours)** field.

3. Click **OK** to activate the specified changes and close the dialog box.

To activate the specified changes without closing the dialog box, click **Apply**.

Stopping the Log Facility

- **To stop the NetShow On-Demand Log Facility**
 1. In the Windows NT task bar tray, double-click the NetShow On-Demand Log Facility icon.
–Or–
Right-click the NetShow On-Demand Log Facility icon in the Windows NT task bar tray, and click **Properties**.
The **Microsoft NetShow Log Facility** dialog box is displayed.
 2. In the **Microsoft NetShow Log Facility** dialog box, clear the **Enable Logging** check box, so that a check mark is *not* visible in the box.
 3. Click **OK** to stop the logging and close the dialog box.
To stop logging without closing the dialog box, click **Apply**.

To Exit the NetShow On-Demand Log Facility

- **To exit the NetShow On-Demand Log Facility**
 1. In the Windows NT task bar tray, right-click the NetShow On-Demand Log Facility icon, and click **Exit**.

Removing the NetShow On-Demand Log Facility from the Windows NT Startup Group

To prevent the Log Facility from automatically starting when the server starts, you can remove the NetShow On-Demand Log Facility from the Windows NT Startup group.

Note that if you remove the NetShow On-Demand Log Facility from the Windows NT Startup group, you need to start the NetShow On-Demand Log Facility from the NetShow On-Demand group to perform the Log Facility procedures described earlier in this section.

To start the NetShow On-Demand Log Facility, you would click **Start**, point to **Programs**, point to **NetShow On-Demand**, and click **On-Demand Log Facility**. The NetShow On-Demand Log Facility icon is displayed in the Windows NT task bar tray. Then, double-click the NetShow On-Demand Log Facility icon in the Windows NT task bar tray.

- **To remove the NetShow On-Demand Log Facility from the Startup group**
 1. In Windows NT Explorer, go to C:\<Windows NT directory>\Profiles\All Users\Start Menu\Programs\Startup.
 2. Select **On-Demand Log Facility**, right-click, and then click **Delete** (or press DELETE).

CHAPTER 5

Server Content Management

When Windows NT Server 4.0 is installed, Internet Information Server (IIS) is installed too. IIS comes standard with three services— FTP, Gopher, and WWW as well as an application, Internet Service Manager (ISM), to manage these services. The Microsoft NetShow On-Demand Server and IIS work together, making it easy to manage your .asf files and their associated HTTP-based redirector (.asx) files. Understanding how files are organized for the WWW and NetShow On-Demand services will help you effectively manage your system. This section will cover how to manage content, create virtual roots and aliases, and how to add and remove server content for the NetShow On-Demand service.

For more information about the FTP, Gopher, or WWW services, see the Internet Service Manager online Help file. The final portion of this chapter explains the various ways you can use the NetShow On-Demand Player to play .asf content.

The Home Directory and Virtual Roots

During installation, the system administrator establishes a home directory, or virtual root directory, for NetShow On-Demand Server content. The home directory is important because it establishes the root directory that the NetShow On-Demand service will use when it receives a client request. If you're not sure which directory is the home directory, follow these instructions.

- **To find your home directory**
 1. Click the **Start** button, point to **Programs**, point to **Microsoft Internet Server**, and click **Internet Service Manager**.

The **Internet Service Manager** (ISM) window appears. The image below shows the ISM window with the Services view selected. To view ISM using the Services view, on the **View** menu, click **Services View**.



2. Double-click the NetShow On-Demand icon.

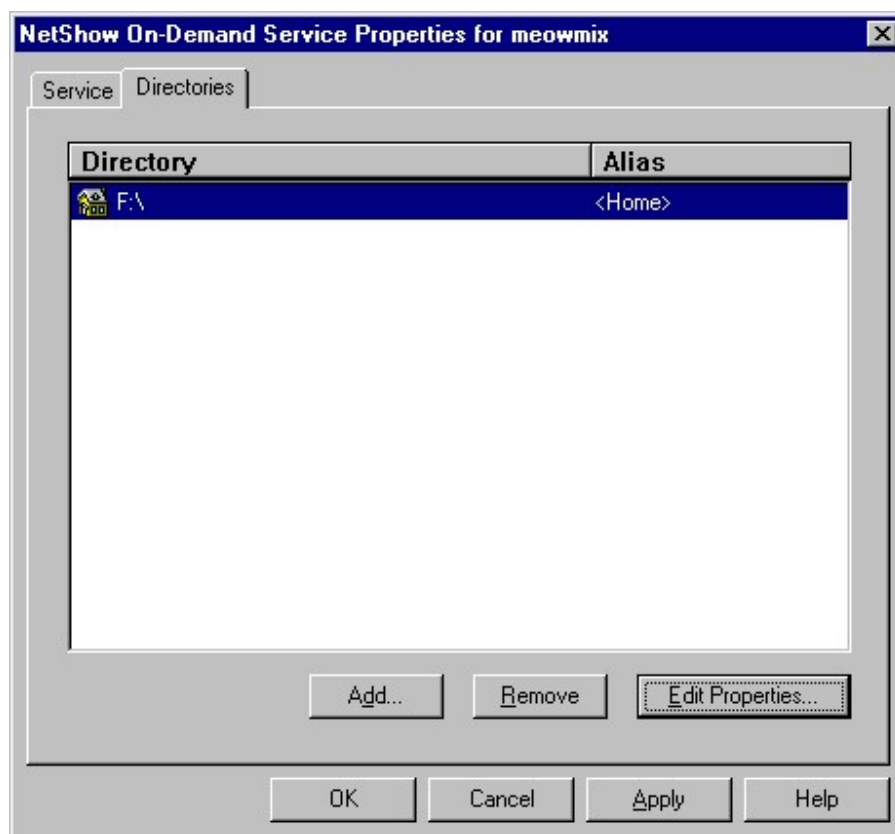
The service explanation expands to show you the name of the NetShow On-Demand Server and its status. Green indicates that the service is running, yellow that it is paused, and red that it is stopped. In the following graphic, the green light indicates that the service is running. Meowmix is the name of the server.



3. Double-click the stoplight icon.

The **NetShow On-Demand Service Properties** dialog box appears.

4. Click the **Directories** tab.



The list of all virtual directories and their aliases appears. Notice in the example above the path for the home directory. All Internet services must have a home directory. The home directory is the “root” directory for that service. A root directory does not have a name. By default, the home directory and all folders in it are available to users. To reference or point to the home directory, type the server name. In the example above, to access content in the home directory (drive F), use the URL `mms://meowmix/`

Place your .asf content in the home directory or any subdirectory of that directory. When a client contacts NetShow On-Demand Server, the NetShow On-Demand service (by default) looks in the home directory for the requested .asf file. For this reason, requests to NetShow On-Demand Server for .asf files should specify the MMS protocol, the name of the server, and the name of the .asf file. For example, to request an .asf file named demo.asf on the NetShow On-Demand server named Meowmix, type:

```
mms://meowmix/demo.asf
```

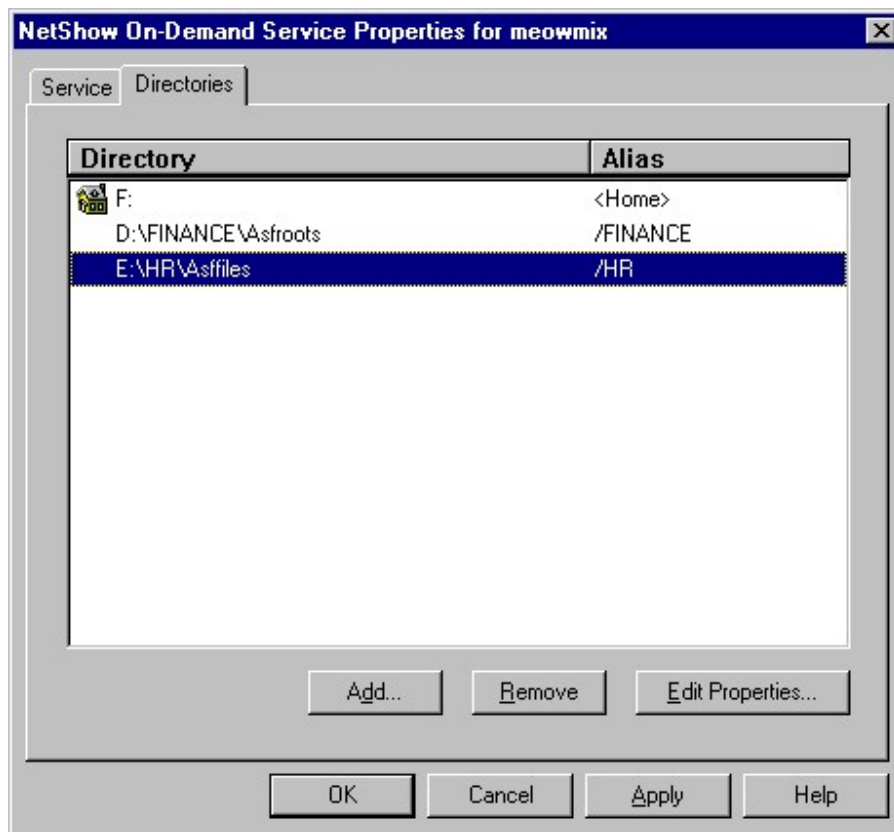
For information on changing your home directory, see the online Help in the Microsoft Internet Service Manager.

Virtual Directories

Virtual directories simplify client URL addresses by presenting an entire set of content directories as a single directory tree. The NetShow On-Demand service can be administered via Microsoft Internet Service Manager (ISM), and it operates similarly to the other services (FTP, Gopher, and WWW). However, unlike with the FTP, Gopher, and WWW services, you should place all NetShow On-Demand service virtual directories on local drives. Specifying a directory across the network using a universal naming convention (UNC) can result in performance problems.

A service can have one home directory and any number of other publishing directories—virtual directories. The home directory is the root of this “virtual” directory tree, and each virtual directory is addressed as if it were a subdirectory of the home directory. Actual subdirectories of the virtual directories and the home directory are available as well.

When you define a virtual directory in ISM, you create an alias for the virtual directory. The alias is the subdirectory name that will be used by clients to access information in the virtual directory. Let’s use the NetShow On-Demand Server, Meowmix, as an example. This server has several SCSI drives dedicated to storing various types of multimedia information, including .asf files. We created two virtual directories—one directory for finance-oriented .asf files; the other directory for human resources .asf files.



Note

To access a virtual directory, users must know the virtual directory's alias. They will have to use this name when typing the URL in the client. Also, if a URL ambiguously points to two .asf files (one in the home directory and one in the virtual root), NetShow On-Demand Server selects the .asf file found in the virtual root.

Money.asf is a financial .asf file located on drive D:\FINANCE\Asfroots. To stream Money.asf, a user types the URL:

```
mms://meowmix/Finance/money.asf
```

This URL is easier to remember than knowing that Money.asf is in the \FINANCE\Asfroots directory on the Meowmix D drive. Other benefits of using virtual roots include:

- If you move the content you don't have to change paths within the Web pages or applications that reference the content. Instead, you edit the virtual directory's alias so that it references the new path to the content.
- You can easily add capacity. If a storage device becomes full, an administrator can attach a larger or additional storage device and then change the path for the virtual root's alias.

You must use IIS to create, configure, and edit virtual roots. For information on how to create and edit virtual directories, see "Adding a Virtual Root Directory for Content," in Chapter 4, "Server Administration."

Adding and Removing Content

You can use either File Manager or Windows Explorer to add and remove content from a NetShow On-Demand server.

NetShow On-Demand servers can be isolated from the Internet. Internet Information Server uses Windows NT file sharing to securely deliver content to the user without exposing other computers on the local area network to high risk from intruders.

ASX Files

ActiveX stream redirector (.asx) files are necessary for playing .asf files from a Web page that does not contain an embedded NetShow On-Demand Player. An .asx file provides the information that NetShow On-Demand Player needs to connect to a server. An .asx file is a one-line text file whose contents look like this:

```
ASF protocol://servername/virtualdir/filename.asf
```

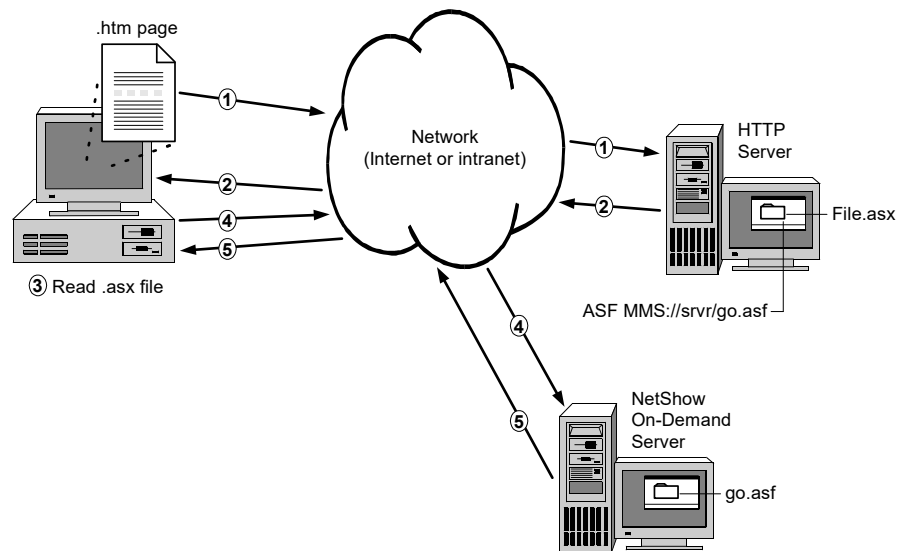
An .asx file specifies:

- The protocol used (either HTTP or MMS)
- The name of the server
- A virtual directory (if necessary)
- The .asf file.

Only one .asf file can be specified per .asx file. Place your .asx files in a directory on an HTTP server. It is a good idea to create a virtual directory for the .asx files so that it is easy to create, remember, and possibly edit the path to these files.

How the ASX File Works

The most common scenario for using an .asx file is as a link in a Web page. The following graphic lays out the action when a user clicks an .asx file in a Web page.



In this scenario NetShow On-Demand Player (NSOPlayr.exe) is called as an external player. The following sequence describes the steps that the client, HTTP server, and NetShow On-Demand Server go through:

1. On a client, the user clicks a link, `<A HREF=HTTP://webserver/file.asx>`, that requests the downloading of the .asx file.
2. The HTTP server sends the .asx file. to the client computer.
3. The client computer reads the .asx file (ASF mms://Srvr/go.asf) and determines which server to contact and which .asf file to request. The client computer launches NSOPlayr.exe.
4. The client computer contacts NetShow On-Demand Server and requests the .asf file.
5. NetShow On-Demand Server begins streaming the .asf file to the client.

How to Create an ASX File

An .asx file is a one-line text file that consists of a tag identifying the format of the data you want to stream (ASF) and a URL that points to the file you want to play. For example:

```
ASF MMS://path/filename.asf
```

When specifying a protocol, you can use MMS or HTTP. Be aware that the protocol you use affects how the server will stream the file. NetShow On-Demand Server, which is what you intend to use when you specify MMS, uses User Datagram Protocol (UDP). An HTTP server uses Transport Control Protocol (TCP) to stream information. TCP is reliable, but based on this, an HTTP server's streaming performance suffers when placed under heavy duress (especially on the Internet). UDP, although not reliable, does a better job of getting the streaming information to the client in a timely manner. The user experiences a better, smoother, and more likely uninterrupted playback.

- **To create an .asx file using Notepad (or another text editor)**

1. Locate the home directory that contains the .asf files.

This is the directory the system administrator specified while installing NetShow On-Demand Server. You can use Internet Service Manager to find the directory that was specified as the home directory for that server's content.

2. Open your text editor and type:

```
ASF mms://servername/virdir/filename.asf
```

ASF must be in capital letters and followed by a single space. NetShow On-Demand Player uses the URL immediately following the space. Begin the URL by specifying either the MMS or the HTTP protocol. Use MMS when specifying NetShow On-Demand Server; use HTTP when specifying an HTTP server. In this syntax, *servername* is the name of the server, *virdir* is the virtual directory if one exists (virtual directories are covered earlier in this section), and *filename.asf* is the .asf file that will stream.

3. Save the redirector file as a text file with an .asx extension.
4. Place the .asx file in an accessible directory on an HTTP server.

Using NetShow On-Demand Player

There are three ways of using NetShow On-Demand Player to play .asf files:

- As a stand-alone player
- Launched from a link in a Web page
- Embedded in a Web page, Visual Basic script application, or other ActiveX container application

Using a Stand-Alone Player

When you use NetShow On-Demand Player as a stand-alone application, you can decide how you want to access the .asf files. If you play an .asf file locally, you are not streaming the file. NetShow On-Demand Player reads the .asf file from the hard drive and then plays it. If you play an .asf file from a remote location, it will stream to your computer. When you play an .asf file you must specify a protocol (either HTTP or MMS), a server, and an .asf file. The following instructions explain how to open NetShow On-Demand Player and use it to play an .asf file locally and from a remote location.

- **To open NetShow On-Demand Player**
 - Click the **Start** button, point to **Programs**, point to **Microsoft NetShow**, and click **Microsoft NetShow On-Demand Player**.

The NetShow On-Demand Player appears.

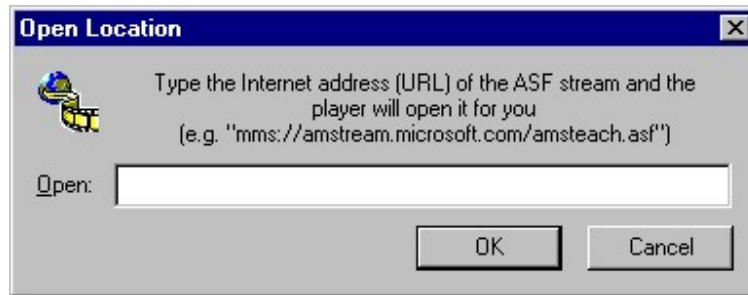


- **To open a local .asf file**
 1. On the **File** menu, click **Open File**.
The **Open** dialog box appears.
 2. In the **Open** dialog box, choose the .asf file you want to play.
NetShow On-Demand Player buffers the .asf file and then begins playing it.

- **To open an .asf file in a remote location**

1. On the **File** menu, click **Open Location**.

The **Open Location** dialog box appears.



2. In the **Open Location** dialog box, type the URL of the .asf file you want to play.

NetShow On-Demand Player buffers the .asf file and then begins playing it.

Launching the Player from a Web Page

To launch NetShow On-Demand Player from a Web page, create a URL in the HTML code that looks something like this:

```
<A HREF=HTTP://server/file.asx>
```

The previous section, “How the ASX File Works,” explains how NetShow On-Demand Player is launched when a user clicks a link in a Web page.

Embedding NetShow On-Demand Player in a Web Page

An easy way of providing NetShow On-Demand Player to people who don't already have it on their computers is to embed NetShow On-Demand Player in a Web page. When a user accesses the page, the player is optionally downloaded. In the script commands that you use to embed the Player you can set the property that identifies the .asf file to play as well as how to play it.

The following script shows the NetShow On-Demand Player class ID and several of its properties. To learn more about NetShow On-Demand Player and its properties, see the *NetShow On-Demand Client SDK*.

```
<OBJECT CLASSID="clsid:2179C5D3-EBFF-11cf-B6FD-00AA00B4E220"  
HEIGHT=240  
WIDTH=320  
NAME=NSOPlay  
ID=NSOPlay  
>  
<PARAM NAME="FileName" VALUE="mms://NSOserver/demo.asf">  
</OBJECT>
```

How you set the parameters determines how NetShow On-Demand Player will work. The FileName parameter identifies the .asf file that will play. You set the value for this parameter to be a URL just as if you were going to play the .asf file from the **Open Location** option on the NetShow On-Demand Player **File** menu. For more information on embedding NetShow On-Demand Player in a Web page or Visual Basic application, see the *NetShow On-Demand Client SDK*.

CHAPTER 6

Client Installation and Configuration

This chapter describes hardware and software requirements for Microsoft NetShow On-Demand client computers. It also describes how to install the Microsoft NetShow On-Demand Player and NetShow On-Demand Tools.

Hardware Requirements

The following table summarizes the minimum and recommended hardware for a NetShow On-Demand client computer running Windows 95 or Windows NT Workstation.

Component	Recommended	Minimum
Processor	Pentium/133 MHz (for higher bit rates)	486/50 MHz
Bus	PCI	EISA
Memory	16 MB RAM	8 MB RAM (Windows 95) 12 MB RAM (Windows NT)
NIC (network interface card)	High-throughput Ethernet NIC	Any Ethernet client adapter
Sound card and speakers	Any 16-bit sound card	Any 16-bit sound card

Software Requirements

Client Software

Before installing Microsoft NetShow On-Demand Player and NetShow On-Demand Tools, the client computer should have the following installed:

- Microsoft Windows 95 or Microsoft Windows NT, Workstation or Server, version 3.51 or 4.0 (required)
- Microsoft Internet Explorer 3.0 or above (recommended)

Note

Microsoft has tested the client software with Microsoft Internet Explorer, versions 2.0 and 3.0. Microsoft has also tested the client software with Netscape Navigator version 2.0 and 3.0. Netscape Navigator can display ActiveX controls using the ActiveX plug-in for Netscape. This plug-in is available in a beta version from Ncompass Labs at <http://www.ncompasslabs.com>.

Browser MIME-Type Considerations

With Microsoft Internet Explorer, the MIME (Multipurpose Internet Mail Extensions) type is set automatically—this is true even when you install Internet Explorer after installing NetShow On-Demand Player.

With Netscape Navigator, the MIME type is set only if Netscape Navigator is installed *prior* to installing NetShow On-Demand Player.

If you're using a browser other than Microsoft Internet Explorer or Netscape Navigator (or if you've installed Netscape Navigator after installing NetShow On-Demand Player), you must set the MIME types manually. To do so, refer to your browser documentation to determine how to add the following settings:

MIME type: `video/x-ms-asf`

Extensions: `asf, asx`

Helper application: `nsoplayr.exe`

Microsoft NetShow On-Demand Installation

Preparing the Client Computer

Check the following before you install NetShow On-Demand Player:

- The client must be run on a computer running Windows 95 or Windows NT, Workstation or Server, version 3.51 or 4.0.
- Make sure the client computer has a sound card installed and that it is configured properly—NetShow On-Demand Player will not work without a properly installed sound card.
- Verify that the computer can connect to the network via TCP/IP and that you can see the server from the client. If you need help with the installation procedure, see your system administrator.

Installing NetShow On-Demand Player

- **To download NetShow On-Demand Player**

1. Nsoplay.exe is a self-extracting file that installs Microsoft NetShow On-Demand Player.

One way to get this file is to connect to <http://www.microsoft.com/netshow/> and download it. Or you can go to your NetShow On-Demand server page, and then download it.



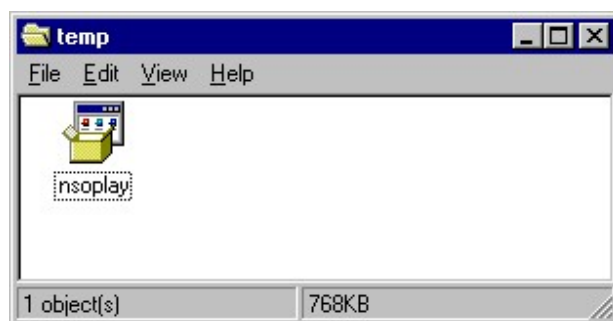
2. Click **Save it to disk** and copy Nsoplay.exe to your temporary directory.

Note

Saving Nsoplay.exe to your temporary directory before starting the installation process is not required—however, this makes it easy to reinstall NetShow On-Demand Player (after uninstalling first, simply go to the temporary directory and run Nsoplay.exe again).

- **To install NetShow On-Demand Player**

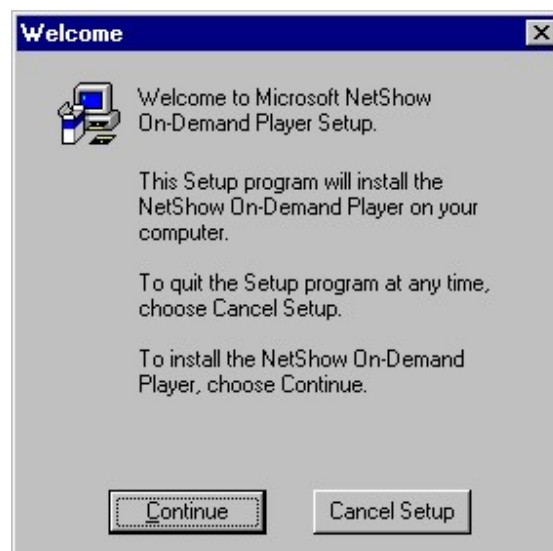
1. Go to your temporary directory, and then double-click the nsoplay icon.



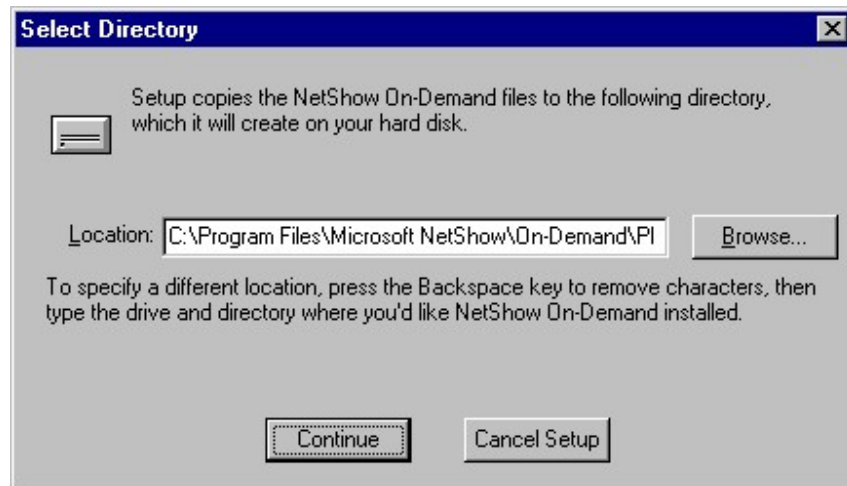
2. Setup first prompts you to accept the terms of your agreement with Microsoft. If you accept these terms, click **Yes** to continue.



3. In the **Welcome** dialog box, click **Continue**.



4. The **Select Directory** dialog box specifies the destination directory for NetShow On-Demand Player. To accept the default location of C:\Program Files\Microsoft NetShow\OnDemand\Player, click **Continue**.



5. The **Select Start Menu Program Group** dialog box lets you specify the location for the NetShow On-Demand program icon. To accept the default location (which creates a new program group), click **Continue**.



6. When Setup is finished, click **OK**.



- **To test NetShow On-Demand Player**

During the NetShow On-Demand Server installation, a sample .asf file is automatically copied to the virtual root directory. Use the following procedure to play this sample file and to verify that NetShow On-Demand Server, NetShow On-Demand Player, and your network connection are all working properly.

1. Make sure you're at the client computer.
2. On the Windows NT **Start** menu, point to **Programs**, point to **Microsoft NetShow**, and then click **NetShow On-Demand Player**.
3. From the **File** menu, click **Open Location**.
4. In the **Open** box, type `mms://<yourservername>/sample.asf`.

For example:

`mms://netshow/sample.asf`

`mms://157.34.45.234/sample.asf`

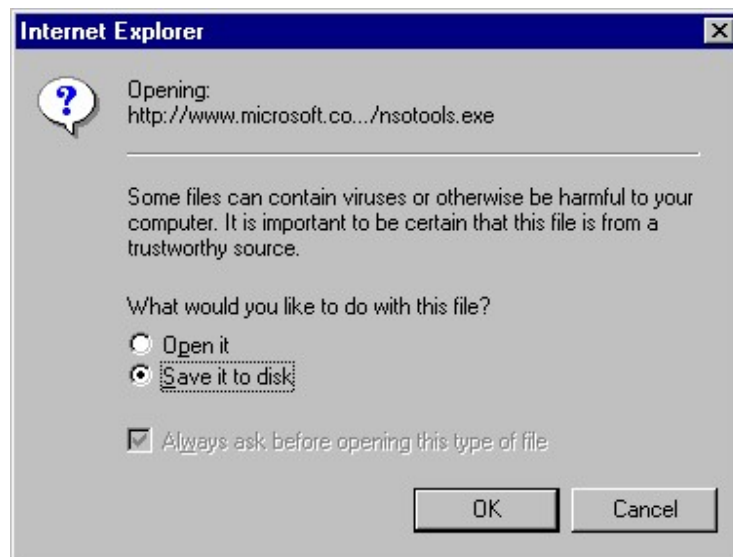
`mms://www.company.com/sample.asf`

5. Click **OK**.

Installing the Tools

Microsoft NetShow On-Demand Tools includes:

- *Conversion tools.* VidToAsf.exe for converting .avi and .mov files to .asf, WavToAsf.exe for converting .wav files.
 - *ASF Editor.* Winase.exe for creating .asf files.
- **To download NetShow On-Demand Tools**
 1. Using Microsoft Internet Explorer, go to your NetShow On-Demand server page, and then download Nsotools.exe.



2. Click **Save it to disk** and copy Nsotools.exe to your temporary directory.

Note

Saving Nsotools.exe to your temporary directory before starting the installation process is not required—however, this makes it easy to reinstall the tools (after uninstalling first, simply go to the temporary directory and run Nsotools.exe again).

- **To install NetShow On-Demand Tools**

1. Go to your temporary directory, and then double-click the nsotools icon.



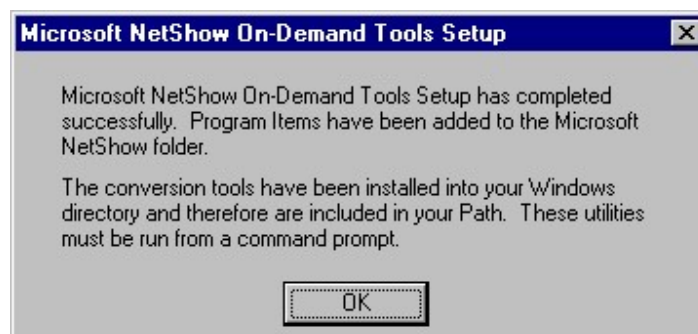
2. Setup first prompts you to accept the terms of your agreement with Microsoft. Click **Yes** to continue if you accept the terms.



3. In the **Welcome** dialog box, click **Continue**.

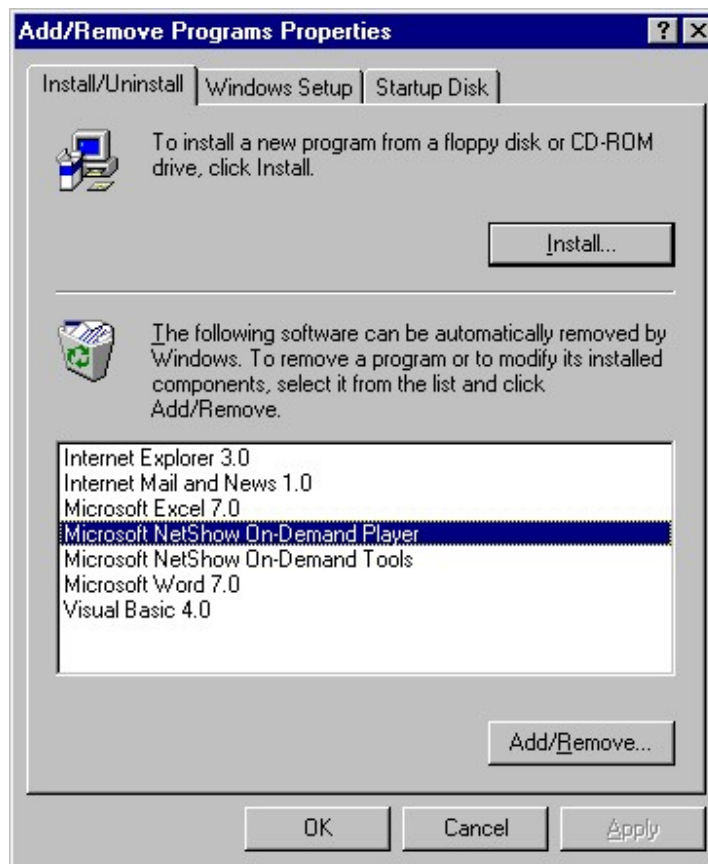


4. When Setup is finished, click **OK**.

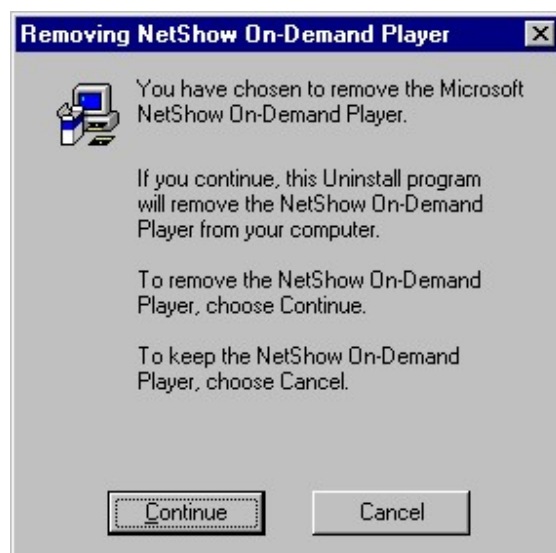


Uninstalling Software

- **To remove NetShow On-Demand Player**
 1. Click **Start**, point to **Settings**, and then point to **Control Panel**.
 2. Double-click **Add/Remove Programs**. In the **Add/Remove Programs** window, click **Microsoft NetShow On-Demand Player**.



3. Click **Add/Remove**.

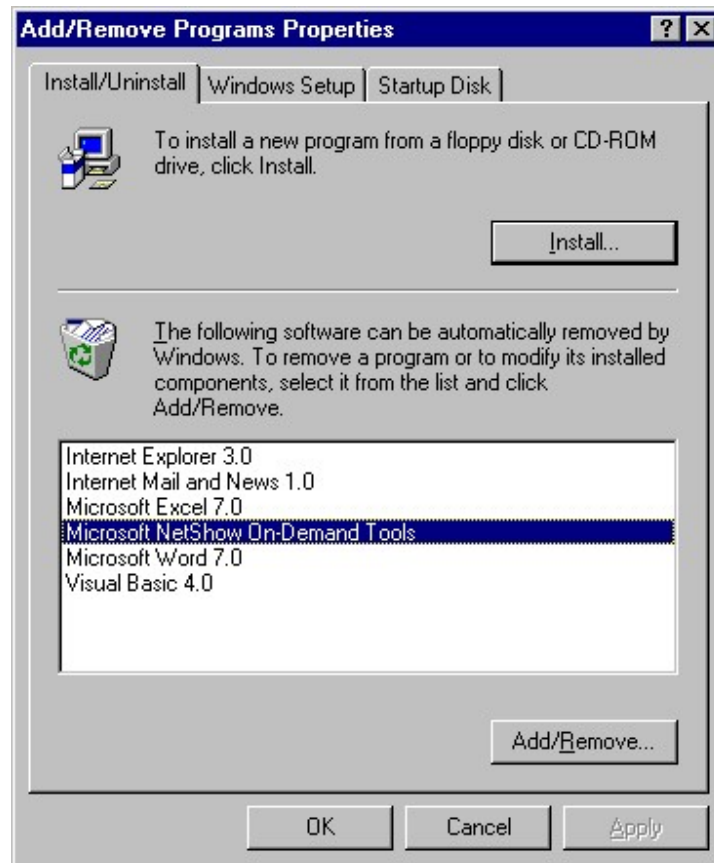


4. Click **Continue**.



5. When the uninstall program is done, click **OK**.

- **To remove NetShow On-Demand Tools**
 1. Click **Start**, point to **Settings**, and then point to **Control Panel**.
 2. Double-click **Add/Remove Programs**. In the **Add/Remove Programs** window, click **Microsoft NetShow On-Demand Tools**.



3. Click Add/Remove.



4. Click **Continue**.



5. When the uninstall program is done, click **OK**.

C H A P T E R 7

Content Creation

This chapter explains the various ways to create ActiveX streaming format (.asf) files. It covers the specifics of how to create .asf files from various sources, limitations that the Internet and intranets place on .asf files, and the tools that you can use to create .asf files.

The three primary tools that you can use to create .asf files are ASF Editor, VidToAsf, and WavToAsf. This chapter will detail how to use VidToAsf and WavToAsf and briefly touch on the ASF Editor. For more information on the ASF Editor, please see the ASF Editor online Help file.

What Is an .asf File?

An .asf file is a multimedia file format for streaming information across the Internet or an intranet. With .asf files, you can deliver multimedia content, such as synchronized images and audio, audio only, or video, at various data rates. Within an .asf file (while it is playing), you can open Web pages, deliver scripting commands to the client computer, and create an entire user experience.

Some practical uses of .asf files might be to deliver training video or converted PowerPoint presentations to the computer desktop, or to deliver audio with synchronized images. With the ability to embed scripting commands, you can extend the ability of the .asf file so that it can invoke URLs, process feedback from the user, and execute client-side commands. Later in this documentation are links to Web pages that demonstrate the techniques that are described.

Using .asf Files in the Internet and Intranet Environments

An .asf file is designed to be streamed from NetShow On-Demand Server to NetShow On-Demand Player. The Server and Player can be on the Internet or an intranet, and they can be separated by a firewall. The only difference in the various environments that you, as content creator, need to keep in mind is the bandwidth of the network that the .asf file travels over.

An .asf file delivered over the Internet probably needs to be smaller in bandwidth than one delivered over an intranet. Users in different environments can have a tremendous difference in bandwidth. When you create an .asf file, one of the first tasks is to specify a bit rate (or bandwidth that the file will stream over). Most Internet users have 28.8-kilobit per second (kbps) modems, which means the largest .asf file that they can receive can be about 23 kbps (this allows for degraded connection speeds).

Intranets can allow for .asf files that stream at a much higher bit rate. The network administrator and the size of the network enforce restrictions on the bandwidth of the .asf files streamed over an intranet. During installation, the administrator who sets up NetShow On-Demand Server sets the maximum file size that the server can stream. This restriction keeps the server, during high use, from streaming so much information that it bogs down the overall flow of information on the network. Keep in mind that only NetShow On-Demand Server allows you to restrict the bandwidth of files that it will stream. You will have no way of restricting the bandwidth of .asf files streamed across the network if you use an HTTP server.

Understanding the Constraints on an .asf File

Because network bandwidths constrain .asf files, you should understand how this affects the size of the .asf files you can create. Other than ASF Editor, the tools that you use to create .asf files do not force you to scale your source files to fit a certain bandwidth. You, creator of the .asf files, must convert the source files to fit within the network bandwidth.

The system administrator who installs NetShow On-Demand Server determines how large an .asf file the server can stream. Before you begin creating .asf files, check the server's maximum .asf file bit rate. To determine the maximum .asf file bandwidth allowed, see Chapter 3, "Server Installation and Configuration."

Once you understand the limits of the size of the .asf file you can create, you are ready to begin.

Where Do I Begin?

It's easy to begin creating .asf files because you probably already have the source material you need. You can create .asf files from a variety of sources, including:

- *Video.* A .mov or .avi file.
- *Images.* Any image in the .bmp, .dib, .rle, .jpg, or .gif format.
- *Audio.* Any .wav files that use any ACM codec, that is, any .wav file you can play on your computer (your Windows 95 or Windows NT operating system contains these codecs).
- *PowerPoint presentations.* You can use the PowerPoint Internet Assistant (PPTIA) to convert PowerPoint slides into .jpg images. You can then use ASF Editor to build an .asf file with these .jpg images.

Several tools are provided so that you can use the various sources to create .asf files. However, before you use these tools, you may want to edit your source files.

If you are using video (.mov or .avi files) to create .asf files and the intended .asf files are too large to fit on your server, reduce the bandwidth of the source. Use a third party tool such as VidEdit, AVIEdit, or Adobe Premiere to edit key frames, reduce the size (height and width), reduce the frames per second, lower the source's color bit depth, or compress the source with a video codec. Neither VidToAsf nor ASF Editor is designed to edit video sources. Because audio is part of the video source, you can also reduce the size of the resulting .asf file by stripping the audio from the video source and compressing the audio in an audio editor such as Sound Recorder. After compressing the audio, you can then incorporate the compressed audio into the .asf file.

If you are using images and audio to build .asf files, use the image and audio conversion tools that come with the ASF Editor to reduce the size of the source files. Directions on how to use the codecs are in the ASF Editor Help file.

Tools for Creating .asf Files

There are several types of .asf editing tools provided. Each tool has a specific use in terms of taking a particular source and turning it into an .asf file. The tools are:

- *ASF Editor.* A GUI tool that you can use to synchronize audio, images, URLs, and script commands along a time line and then turn all of it into an .asf file.
- *VidToAsf.* A command line utility that you can use to convert .avi or .mov files into .asf files. Using a command line option you can also specify script files that will add markers, invoke URLs, and execute script commands. For more information, see the section "VidToAsf and WavToAsf Command-Line Options" later in this chapter.

- *WavToAsf*. A command-line utility that you can use to convert .wav files into .asf files. Using a command-line option, you can also specify script files that will add markers, invoke URLs, and execute script commands. For more information, see the section “VidToAsf and WavToAsf Command-Line Options” later in this chapter.
- *PowerPoint Internet Assistant*. A PowerPoint add-on tool that you can use to convert PowerPoint slides to .jpg images, which can then be used in ASF Editor. This tool is not included in the Tools setup. You can load PowerPoint Internet Assistant from <http://www.microsoft.com/powerpoint/Internet/IA/default.htm>.

ASF Editor

ASF Editor is the most flexible of all the .asf file creation tools. Unlike the other .asf editing tools, ASF Editor encapsulates several types of media into an .asf file. Use ASF Editor to take source files such as images and audio, and combine them with embedded URLs and script commands. With this combination of media you can create dynamic files that can be fully interactive and can take a user anywhere on the Internet or an intranet. ASF Editor is not a video editing tool. Use VidToAsf to create an .asf file from video.

Another benefit is that ASF Editor lets you assemble and synchronize the content, assign compression to specific files, and then view the .asf file before you build it. ASF Editor supplies predefined bit rates of 14.4, 28.8, and 112.5 kbps, but you can also define your own bit rate. By allowing you to specify or create a bit rate, ASF Editor forces you to create an .asf file that will fit in the specified bandwidth. You cannot build an .asf file that is too big to fit in the chosen bandwidth.

Error Correction

As files stream across a network, it is possible for packets of information to be lost, particularly on the Internet. When packets are lost, the user experiences “choppy” play, loss or gaps in the audio, and/or loss of entire images if enough packets of information are lost. If packets stop being delivered, NetShow On-Demand Player stops rendering until it can rebuild its buffer.

To improve performance when packets of information are lost, NetShow On-Demand Server uses error correction and concealment. ASF Editor can optionally include this redundant error correction data in the stream, which enables NetShow On-Demand Player to correct for certain levels of packet loss. If there is extreme packet loss (to the point where error correction is not possible), the NetShow On-Demand Player masks the errors. For audio masking, NetShow On-Demand Player uses neighboring audio information to conceal the loss of data. If you convert images into loss-tolerant JPEG images, NetShow On-Demand Player uses a “smoothing” algorithm to conceal any lost image data.

This document does not specify how to use ASF Editor. To learn how to use ASF Editor, see the online Help file. For detailed information on how to use NetShow On-Demand Player, see the NetShow On-Demand Client online Help file.

VidToAsf and WavToAsf

VidToAsf and WavToAsf both convert a single file type, video or audio, into an .asf file.

VidToAsf

VidToAsf is the command line conversion utility that you use to convert video to an .asf file. VidToAsf requires that the input video source be .avi or .mov. If you have a video file that is in a different format you must convert it to either .mov or .avi before you can use VidToAsf. If you need to edit or downgrade an .avi or .mov file so that the resulting .asf file can fit in a particular bandwidth, do so before using VidToAsf to convert the file to .asf format. You cannot use .avi files, .mov files, or .asf files created by VidToAsf as input for the ASF Editor, nor can you edit an .asf file after it is built.

Note

NetShow On-Demand support of Quicktime .mov files is incomplete. Quicktime files with non-ACM or ICM data cannot be converted into .asf files. Quicktime VR is not supported at all. However, almost all Quicktime files found on the Internet fall into the supported category.

- **To convert .avi and .mov files to .asf format**

1. Open an MS-DOS command window.
2. From the directory that contains the input source file, enter the following command (substituting the names of your .avi, .mov, and .asf files). The **-out** flag is optional. If you do not specify this flag, VidToAsf creates an output file with the same name as the input file and appends the .asf extension.

```
vidtoasf -in {filename.avi | filename.mov} -out filename.asf
```

WavToAsf

Use the WavToAsf command line conversion utility to convert .wav files to .asf files. WavToAsf creates audio .asf files that contain no images. WavToAsf follows the same conventions as VidToAsf in that you must downgrade the source file before you build an .asf file. Also, you cannot edit the resulting .asf file. WavToAsf can use as input any .wav file that uses one of the ACM codecs that is resident on the computer. If you can play the .wav file on your computer, you can convert it to an .asf file.

- **To convert .wav files to .asf format**
 1. Open an MS-DOS command window.
 2. From the directory that contains the input source file, enter the following command (substituting the names of your .wav and .asf files). The **-out** flag is optional. If you do not specify this flag, VidToAsf creates an output file with the same name as the input file and appends the .asf extension.
wavtoasf -in filename.wav -out filename.asf

VidToAsf and WavToAsf Command-Line Options

VidToAsf and WavToAsf come with a variety of command-line options. These command options, or flags, allow you to specify a particular setting or include additional files that add to the .asf file. To view the options, at the command line type the name of the utility and press ENTER. You will see explanations of the command options similar to the tables in the following sections.

VidToAsf command Options

Flag Name	Flag argument	Description
-audio	<i>stream</i>	If the audio file has more than one stream, use this flag to specify the stream that you want to use. This is the same as the -video flag.
-audiofile	<i>filename</i>	Specify an audio file to take the place of the audio in the video file. The default for this option is to use the audio in the video file.
-bitrate	# of bits/sec	Use this flag to set the bit rate for the output .asf file. The default is to let VidToAsf determine the bit rate for the .asf file.
-buffertime	# of milliseconds	Specify a maximum buffer time. The default is no time limit.
-eccspan	on off	Use this flag to turn error correction on. Error correction is on by default for all .asf files below 150000 kbps, and off by default for all .asf files above. You can override the default by setting the -eccspan option on the command line.
-in	<i>filename.ext</i>	Input video file. This is the file that you are going to turn into an .asf file. This is the only required flag.
- leadtime	# of milliseconds	Specify the desired time that you want the .asf file to wait after it buffers but before it begins playing. The default is 1,000 milliseconds. If you are converting smaller bit rate AVIs (under 100 kbps), it is a good idea to increase the lead time (up to 3000 milliseconds).

Flag Name	Flag argument	Description
-optimize	percentage	You can set a percentage number to specify how closely VidToAsf should calculate the maximum bit rate. The default rate is five percent.
-out	<i>filename.asf</i>	The name that you give the output file. If you don't give the output file a name, VidToAsf uses the name of the input file and substitutes the .asf extension.
-packetsize	# of bytes	Specify the size of the packets, if you want to control the size of the packets. The default is to let VidToAsf determine the packet size.
-script	<i>filename</i>	If you want to add URLs, script commands, content information, or markers to your output file, use this flag to specify the name of the script file to use.
-seekable	on off	Seeking allows you to "fast forward" or "rewind" through an .asf file. When you create an .asf file, VidToAsf issues a warning, "No index built," if there aren't enough key frames for VidToAsf to generate an index. If this happens, you cannot seek in the .asf file. However, if you use the -seekable flag to turn seeking on, VidToAsf will allow seeking in the .asf file, but the .asf file will look imperfect during seeking. The default for this flag is off.
-video	stream	If the video file has more than one stream, use this flag to specify the stream you want to use. Because most video files have only one stream, the default is to use the standard video stream.
-wavespan	# of milliseconds	Wave span is the length (in milliseconds) over which audio will be smeared in the file. If packets are lost, audio smearing helps create better results. Unless you are sure that packets won't be lost, it is better to go with the default (800 ms). If you are sure that packets won't be lost, you might want to turn wave spanning off (-wavespan 0).

WavToAsf command options

Flag name	Flag argument	Description
-eccspan	on off	Use this flag to turn error correction on. The default setting for error correction is on.
-in	<i>filename.wav</i>	Input audio file that will be converted to an .asf file.
- leadtime	# of milliseconds	Specify the maximum time desired before file playing begins. If there is packet loss, lower values may result in poorer audio smearing. The default is 4,000 milliseconds.
-out	<i>filename.asf</i>	The name that you give the output file. If you don't give the output file a name, VidToAsf uses the input file name as the name of the output file and then appends the .asf extension.
-script	<i>filename</i>	If you want to add URLs, script commands, or markers to your output file, use this flag to specify the name of the script file to use.

This section provides detail and examples of the **-script** and **-audiofile** options.

The Script Option

Use the **-script** command option to insert markers and script commands into an .asf file. The **-script** option is extremely powerful; however, some options (such as script commands) require client-side assistance to work properly. You can have a marker section, content information, and a script commands section in one script file. If you use both sections, be sure to correctly start and end each section. The first lines of the marker and script sections must begin with `start_marker_table` and `start_script_table`, respectively. Incorporate markers and script commands into the .asf file during the build process by specifying the **-script** option and naming the script file:

```
vidtoasf -in filename.avi -script script.txt -out filename.asf
```

The following sections describe how to create marker and string command sections. In a script file, lines that begin with semicolons are treated as comments. Blank lines and extra white space are generally ignored. The exception is when the white space appears in a marker name, a URL, or within a script command parameter. Specify the time for markers and URLs in the *HH:MM:SS.t* format, where *H* = hours, *M* = minutes, *S* = seconds, and *t* = tenths of seconds. When identifying times, specify times in terms of the source file.

Markers

A marker is a pointer to a specific time in an .asf file. NetShow On-Demand Player uses markers to seek directly to a point in an .asf file. Markers make it possible for users to maneuver through an .asf file any way they want. A user can skip ahead or skip back to a previous marker to view a portion of the .asf file again.

To create a marker in a script file, specify a time when you want to set the marker, and name the marker. You can name the markers anything you like. A marker script file should look something like this:

```
; Sample Marker script.txt
start_marker_table
8 Marker 1
1:00 Marker 2
1:15 Marker 3
3:00:03 Marker 4
end_marker_table
```

Script Commands

Insert string commands into an .asf file the same way you would insert markers—with the **-script** option and a text file. The two sections below show examples of scripting and URL flipping and captioning. URL flipping works fine by itself, but other script commands require client-side assistance. The captioning in the second example below will require some client-side assistance. For information on how to provide client-side assistance for script commands, see the ScriptCommand Event in the *NetShow On-Demand Client SDK*.

```
; This is how you put content information into your .asf
; file when using vidtoasf or wavtoasf.
Title: This is the title
Author: ASF Maker
Copyright: 1996
Description: text that describes the ASF
Rating: PG
```

```
; Demonstration of URL flipping and captioning
start_script_table
1.0 URL http://NetShow/images/austr1.html&&Display
5.0 Caption Sydney Opera House
12.0 URL http://NetShow/images/austr2.html&&Display
15.0 Caption A nice beach north of Cairnes
32.0 URL http://NetShow/images/austr3.html&&Display
35.0 Caption Australia's rain forest
52.0 URL http://NetShow/images/canad1.html&&Display
55.0 Caption On the way to Zach's house
1:12.0 URL http://NetShow/images/canad2.html&&Display
1:15.0 Caption Canadian Rockies at Banff
1:32.0 URL http://NetShow/images/canad3.html&&Display
1:35.0 Caption Up on Route One;canada3.jpg
1:52.0 URL http://NetShow/images/cyprus2.html&&Display
1:55.0 Caption The birthplace of Aphrodite
end_script_table
```

A URL script command differs a little from a marker. At the time specified, NetShow On-Demand Player tells the default browser to find the specified URL address. For this to work properly, the browser must be able to access the Internet. Be aware that if you include a URL that doesn't exist, the browser will return an error.

The Audiofile Option

The Audiofile option looks like this:

```
vidtoasf -in file.avi -audiofile file.wav -out file.asf
```

The Audiofile flag tells VidToAsf to use the given audio file (`file.wav`), in place of the audio currently in the .avi or .mov file. This option lets you use the codecs that come with the NetShow Tools to compress the audio file. Many video editing tools do not contain as many codecs nor do they support the codecs that are included with the NetShow On-Demand Tools.

- **Prepping and using the audiofile option**

1. Use a video editing tool (such as VidEdit or AVIEdit) to extract the audio from the video file.
2. Open the extracted audio file in Sound Recorder (or any audio editing tool on your computer) and compress the audio with one of the available codecs.

When compressing the audio, be sure to use one of the standard codecs that comes with the Windows 95 or Windows NT operating system or with NetShow On-Demand Player. If you use a codec that isn't resident on the user's machine, the user will not hear audio when trying to play the .asf file.

3. When you convert the video file to .asf format, use the newly compressed audio file in the audiofile option.

PowerPoint Internet Assistant

PowerPoint Internet Assistant (PPTIA) turns PowerPoint presentations into a sequence of HTML pages with one PowerPoint slide per Web page. More importantly, PPTIA turns the PowerPoint slides into .jpg images, which can then be used in the ASF Editor. To learn more about PPTIA and to download it, go to <http://www.microsoft.com/powerpoint/Internet/IA/default.htm>.

The ASF Editor Help pull-down menu contains an option, **Using the ASF Editor with PowerPoint Internet Assistant**, that leads you through the complete process of converting the PowerPoint presentation and adding the slides (in .jpg format) to an ASF Editor project.

Publish to ASF

Publish to ASF is an .asf-producing tool that is part of the PowerPoint application on the Microsoft Office 97 compact disc. This tool is *not* included with the tools provided on the NetShow On-Demand compact disc; however, Publish to ASF is a useful tool for turning PowerPoint presentations into .asf files. Please see the Office 97 compact disc for this tool and instructions on how to use it.

A P P E N D I X A

Client Error Messages

The following error messages appear in the stand-alone player or the status bar of the Control Panel in an embedded NetShow On-Demand control. The descriptions will assist you in resolving problems with NetShow On-Demand Player.

Message: Could not locate server: <servername>.

Description: If you're on a local area network attached to the Internet and are able to access a Web site, but unable to play content on NetShow On-Demand Player, it's possible that a firewall is preventing you from playing content. For more information about NetShow On-Demand and firewalls, please see <http://www.microsoft.com/netshow>.

If there is no firewall present or you've determined it's not the issue, please verify that the server name is correct, the server is running, and your network connection is functioning correctly.

Message: The specified stream type is not recognized.

Description: This error message appears if an unknown protocol name has been specified (such as bad://server/file), or if the file exists but isn't a valid .asx or .asf file (such as c:\word.doc). Valid protocols include mms:// and http://. Verify that the protocol syntax is correct and the file is a valid .asx or .asf file.

Message: A network service failed.

Description: This appears when a network provider (such as Winsock) is not functioning correctly and therefore correct streaming of the content is not possible. Verify your network configuration and settings. It's possible the Winsock settings are incorrect or the version of Winsock is not compatible with your NetShow On-Demand Player. It may be necessary to stop and restart your network connection.

Message: An attempt to acquire a network resource failed.

Description: This occurs when network resources such as sockets or ports aren't available. Please try accessing the content later. If the problem

persists, it may be necessary to stop and restart your network connection.

Message: Server bandwidth exceeded.

Description: The bandwidth required to stream this file is higher than the maximum file bandwidth allowed on the server. NetShow On-Demand Server has settings that allow administrators to limit the maximum bandwidth for a single stream. The file you've requested exceeds the maximum bandwidth set by the administrator. Contact the network administrator to resolve this issue.

Message: You do not have access to the location or file.

Description: This error message appears when you attempt to play content for which you have not been granted permission. Contact the network administrator and request access to the file or location.

Message: Protocol mismatch error.

Description: The client and the server must support the same protocol version. Contact the network administrator and determine the correct NetShow On-Demand Player version needed to play the specified content.

Message: The specified stream type is not recognized.

Description: The content you're trying to play or access is not supported by NetShow On-Demand Player. The file may be an invalid .asf file or not of type .asf. Verify that the file is a correct .asf file. If necessary, contact the network administrator.

Message: The server session limit has been exceeded.

Description: The server has reached its maximum number of connections. NetShow On-Demand Server has settings that allow administrators to limit the number of simultaneous connections. Please try connecting later.

Message: The network connection has failed.

Description: You can't continue to play content because the network connection is no longer available. It's possible there are problems with the network connection, the network itself, or the server. Verify that your network connection is working correctly and try again.

A P P E N D I X B

Server Error Messages

The following error message information has been arranged numerically. Each numeric entry has an associated NetShow On-Demand Server message and includes a description for further clarification.

0x000C0001	<i>Message:</i> NS_S_CALLABORTED <i>Description:</i> The requested operation was aborted by the client.
0x000C0002	<i>Message:</i> NS_S_STREAM_TRUNCATED <i>Description:</i> The stream was purposely stopped before completion.
0x800C0003	<i>Message:</i> NS_W_SERVER_BANDWIDTH_LIMIT <i>Description:</i> The value specified is greater than the server's configured maximum bandwidth.
0x800C0004	<i>Message:</i> NS_W_FILE_BANDWIDTH_LIMIT <i>Description:</i> The value specified is less than the file's maximum bit rate.
0xC00C0005	<i>Message:</i> NS_E_NOCONNECTION <i>Description:</i> There is no connection established with NetShow On-Demand Server. The operation failed.
0xC00C0006	<i>Message:</i> NS_E_CANNOTCONNECT <i>Description:</i> Unable to establish a connection to <i>servername</i> .
0xC00C000D	<i>Message:</i> NS_E_NO_LOCALPLAY <i>Description:</i> Failed to load the local play DLL.
0xC00C000E	<i>Message:</i> NS_E_NETWORK_BUSY <i>Description:</i> The network is busy.

0xC00C000F	<i>Message:</i> NS_E_TOO_MANY_SESS <i>Description:</i> The server session limit was exceeded.
0xC00C0010	<i>Message:</i> NS_E_ALREADY_CONNECTED <i>Description:</i> The network connection already exists.
0xC00C0012	<i>Message:</i> NS_E_PROTOCOL_MISMATCH <i>Description:</i> There is no protocol or protocol version supported by both the client and the server.
0xC00C0013	<i>Message:</i> NS_E_TIMEOUT <i>Description:</i> There was no timely response from the server.
0xC00C0014	<i>Message:</i> NS_E_NET_WRITE <i>Description:</i> Error writing to the network.
0xC00C0015	<i>Message:</i> NS_E_NET_READ <i>Description:</i> Error reading from the network.
0xC00C0018	<i>Message:</i> NS_E_FILE_WRITE <i>Description:</i> Error writing to a file.
0xC00C0019	<i>Message:</i> NS_E_FILE_READ <i>Description:</i> Error reading from a file.
0xC00C001C	<i>Message:</i> NS_E_INVALID_NAME <i>Description:</i> The file name, directory name, or volume label syntax is incorrect.
0xC00C001D	<i>Message:</i> NS_E_FILE_OPEN_FAILED <i>Description:</i> Failed to open a file.
0xC00C0020	<i>Message:</i> NS_E_FILE_PLAY_FAILED <i>Description:</i> Unable to play a file.
0xC00C0025	<i>Message:</i> NS_E_BUSY <i>Description:</i> The requested resource is in use.
0xC00C0026	<i>Message:</i> NS_E_UNRECOGNIZED_STREAM_TYPE <i>Description:</i> The specified stream type is not recognized.
0xC00C0027	<i>Message:</i> NS_E_NETWORK_SERVICE_FAILURE <i>Description:</i> The network service provider failed.

0xC00C0028	<i>Message:</i> NS_E_NETWORK_RESOURCE_FAILURE <i>Description:</i> An attempt to acquire a network resource failed.
0xC00C0029	<i>Message:</i> NS_E_CONNECTION_FAILURE <i>Description:</i> The network connection has failed.
0xC00C002A	<i>Message:</i> NS_E_SHUTDOWN <i>Description:</i> The session is being terminated locally.
0xC00C002B	<i>Message:</i> NS_E_INVALID_REQUEST <i>Description:</i> The request is invalid in the current state.
0xC00C002C	<i>Message:</i> NS_E_INSUFFICIENT_BANDWIDTH <i>Description:</i> There is insufficient bandwidth available to fulfill the request.
0xC00C002F	<i>Message:</i> NS_E_INVALID_DATA <i>Description:</i> Invalid or corrupt data was encountered.
0xC00C0030	<i>Message:</i> NS_E_FILE_BANDWIDTH_LIMIT <i>Description:</i> The bandwidth required to stream a file is higher than the maximum file bandwidth allowed on the server.
0xC00C0031	<i>Message:</i> NS_E_OPEN_FILE_LIMIT <i>Description:</i> The client cannot have any more files open simultaneously.
0xC00C0032	<i>Message:</i> NS_E_BAD_CONTROL_DATA <i>Description:</i> The server received invalid data from the client on the control connection.
0xC00C0033	<i>Message:</i> NS_E_NO_STREAM <i>Description:</i> The server is not currently streaming any data.
0xC00C0034	<i>Message:</i> NS_E_STREAM_END <i>Description:</i> There is no more data in the stream.
0xC00C0035L	<i>Message:</i> NS_E_SERVER_NOT_FOUND <i>Description:</i> The specified server could not be found.

- 0xC00C0037** *Message:* NS_E_MAX_BITRATE
Description: Cannot exceed the maximum bandwidth limit of MAXBANDWIDTH.
- 0xC00C0038** *Message:* NS_E_MAX_CLIENTS
Description: Cannot exceed the maximum client limit of MAXCLIENTS.
- 0xC00C0039** *Message:* NS_E_MAX_FILERATE
Description: Cannot exceed the maximum file rate of MAXFILEBITRATE.

Glossary

This glossary documents terms found in the documentation for NetShow On-Demand. See the Windows NT or Windows 95 online Help for additional information.

A

ActiveX Microsoft ActiveX technologies refer to an open technology platform that extends the Windows architecture to include Internet and corporate intranet features and capabilities. It embraces both Java and Microsoft's Component Object Model (COM) technologies.

ActiveX controls ActiveX controls as embeddable controls written to the ActiveX specification. An ActiveX control can be embedded in a Visual Basic form, a Visual C++ resource, or an HTML page.

ActiveX streaming format (.asf) A low-overhead storage and transmission format that encapsulates multimedia data types (images, audio, AVI, and so forth) as well as Uniform Resource Locators (URLs), and allows for the synchronization of these objects within a stream. .Asf files can include audio, multimedia slide shows, and video content. NetShow On-Demand Server stores and streams .asf files.

ActiveX stream redirector (.asx) file A one-line text file that transfers control of the data stream from the HTTP browser to the NetShow On-Demand Player application so that the data can stream. For more information, see Chapter 5, "Server Content Management."

Aggregate output The total amount of data that NetShow On-Demand Server is streaming to clients. This number is based on the following factors:

- Maximum number of clients you want connected to your server at any given time and/or
- Total aggregate bit rate (measured as units in bits/second) the server will stream and/or
- Maximum bit rate (measured as units in bits/second) any one file can be streamed]

ASF Editor Project (.aep) file A one-line text file that transfers control of the data stream from the HTTP browser to the NetShow On-Demand Player application so that the data can stream. For more information, see Chapter 5, “Server Content Management.”

ASF Editor A graphical tool that allows you to author, test, and generate an ActiveX streaming format (.asf) file. The tool is designed to handle most of the issues of encoding and timing of low to mid bit-rate content. It allows the author to place objects—sounds, images, and Uniform Resource Locators (URLs)—so that they appear at the correct time during playback.

B

Bandwidth In communications, the difference between the highest and lowest frequencies in a given range. For example, a telephone line accommodates a bandwidth of 3000 Hz, the difference between the lowest (300 Hz) and highest (3300 Hz) frequencies it can carry.

In computer networks, greater bandwidth networks indicate faster data-transfer capability. Bandwidth is expressed in bits per second (bps). In the NetShow On-Demand environment, the NetShow On-Demand Server administrator can determine the maximum aggregate bandwidth that can be devoted to servicing NetShow On-Demand clients, and can also determine the maximum file bit rate for the .Asf files that are streamed from the server.

C

Codec (Compressor/Decompressor) An algorithm or scheme used when recording digital video or audio. A codec comes into play, for example, when video is transmitted over a phone line; the video must be compressed on the sending end and decompressed on the receiving end. Many codec schemes are available, depending on image quality and file size.

Counters A component that measures and graphically charts the performance of a system object over time. A counter is defined by the object with which it is associated, and these counters can be loaded into Performance Monitor to graphically chart the performance of the associated object.

The counters for the NetShow On-Demand Server are defined in `Nsoperf.pmc`.

E

EISA Extended Industry Standard Architecture. A 32-bit bus standard introduced in 1988 by a consortium of nine computer-industry companies. EISA maintains compatibility with the earlier Industry Standard Architecture (ISA), but provides for additional features.

Events (System) System occurrences, such as user logons, that are logged to a tool designed to monitor such occurrences and to display them in a window or log them to a file. The Trace Facility, which is included with NetShow On-Demand Server, logs NetShow events to a window. The Log Facility logs these events to a Microsoft Access database. Windows NT Event Viewer logs system, application, and security events.

Events (Language) An action recognized by an object, such as an ActiveX control, and for which you can write code to respond. Events can occur as a result of a user action or program code, or they can be triggered by the operating system.

F

Firewall A system or combination of systems that enforces a boundary between two or more networks and keeps unauthorized users out of private networks.

H

Hypertext Markup Language (HTML) The language used to format information displayed on corporate intranets and the World Wide Web. HTML is a subset of Standard Generalized Markup Language (SGML), and like SGML, HTML uses tags to identify the format for a particular piece of information.

Hypertext Transfer Protocol (HTTP) A protocol used to access information over intranets and the Internet. Other common protocols are FTP and Gopher.

I

Illustrated Audio A multimedia type that combines audio with synchronized images to make up an online slide show that runs at low bandwidths.

Internet Information Server (IIS) Internet Server software designed to run on Windows NT Server. IIS includes an FTP, Gopher, and World Wide Web publishing service.

Internet Information Server Service ManagerA Windows-based component of the Internet Information Server (IIS) through which IIS services are configured.

IntranetA TCP/IP network that can be connected to the Internet but is usually protected by a firewall or other device (for example, a corporate network).

K

None.

L

Local area network (LAN)A group of computers and other devices dispersed over a relatively limited area and connected by a communications link that enables any device to interact with any other on the network.

M

Microsoft Internet Explorer 3.0A Windows-based Web browser manufactured by Microsoft Corporation.

Microsoft Media Server (MMS) protocolA protocol used to reference and stream .asf files from Microsoft NetShow On-Demand Server. For an example of MMS protocol, see the Microsoft Internet Explorer 3.0 sample on the Beta CD in \Software\Msie30\Sample.

Microsoft NetShow On-Demand ServerA component of Microsoft NetShow On-Demand that runs as a Windows NT Server service, and that is capable of delivering multiple-bit-rate audio and video streams to Windows 95 and Windows NT clients.

Microsoft NetShow On-Demand PlayerA client designed to support the streaming of data from NetShow On-Demand Server. This client can run as a stand-alone client executable, or can be embedded in Web pages or MFC and Visual Basic applications via the client OCX (Nsoplay.ocx).

(MIME) Multipurpose Internet Mail ExtensionsOriginally designed as a means to encode files in Internet email, MIME has evolved into a generic method for indicating the type of a file in newsgroup postings, e-mail, and the World Wide Web.

N

Netscape Navigator A World Wide Web browser manufactured by Netscape Communications Corporation.

NetShow On-Demand Server A Windows NT service designed for storage and real-time delivery of .asf files. NetShow On-Demand Server streams .asf files at varied bit rates, and is intended for use on an intranet or the Internet. In the corporate network environment, the server is targeted initially at 10 Mbps and 100 Mbps Ethernet networks.

NetShow On-Demand Player An ActiveX-based client Player application that works with Internet browser software to allow playback of .asf files.

NetShow On-Demand Log Facility A Windows-based component of the NetShow On-Demand Server that makes it possible to log NetShow On-Demand events to a DAO object, such as a Microsoft Access database.

NetShow On-Demand Trace Facility A NetShow On-Demand Server troubleshooting utility that logs the events that you specify directly to the Trace Facility window. You can configure the Trace Facility to log certain types of events and you can save the results of a trace to file.

P

Packet A transmission unit of fixed maximum size that consists of binary information representing both data and a header containing an ID number, source and destination address, and error-control data.

PCI Peripheral Component Interface/Interconnect. A self-configuring personal computer local bus designed by Intel. The PCI bus runs at 33 MHz, and though used mostly on Pentium-based computers, the PCI bus is compatible with other architectures.

S

Stripe set Refers to the saving of data across identical partitions on different drives. A stripe set does not provide fault tolerance; however, stripe sets with parity do.

T

Transport Control Protocol /Internet Protocol (TCP/IP) A networking protocol that allows computers to communicate across interconnected networks and the Internet. Every computer on the Internet supports TCP/IP.

U

Uniform Resource Locator (URL) A pointer to information on the Internet. A URL provides the address of a particular piece of data, and consists of the following:

- A protocol identifier, such as http:
- The host name, such as msn.com
- The directory and/or file name

For example, the following URL is the address of Microsoft's corporate Web page, "Microsoft on the Web."

```
http://www.microsoft.com
```

V

VidToAsf A command-line utility that allows you to quickly convert an edited .avi or .mov file to an .asf file so that it can be stored on NetShow On-Demand Server and streamed to clients running NetShow On-Demand Player.

Virtual Directory One or more physical directories that bear the same alias, so that they are referenced identically in a URL. For example, you might store .asf content in ten different physical directories, and then assign these ten directories the alias *movies* so that content in any of these directories would be referenced as follows:

```
mms://server_name/movies/asf_file.asf
```

In the example above, the fact that *movies* references any one of ten different physical directories is transparent to the client.

W

WavToAsf A command-line utility that allows you to quickly convert an edited .wav audio file to an .asf file so that it can be stored on NetShow On-Demand Server and streamed to clients running NetShow On-Demand Player.